CURTIS'S
BOTANICAL MAGAZINE,

ILLUSTRATING AND DESCRIBING

Plants of the Royal Botanic Gardens of Kew,

AND OF OTHER BOTANICAL ESTABLISHMENTS;

EDITED BY

SIR DAVID PRAIN, C.M.G., C.I.E., LL.D., F.R.S.,

DIRECTOR, ROYAL BOTANIC GARDENS, KEW.

VOL. X.

OF THE FOURTH SERIES.

(*Or Vol. CXL. of the Whole Work.*)

> "No flower in field that dainty odour throws
> And decks his branch with blossoms over all
> But there was planted or grew natural."
>
> SPENSER.

LONDON:
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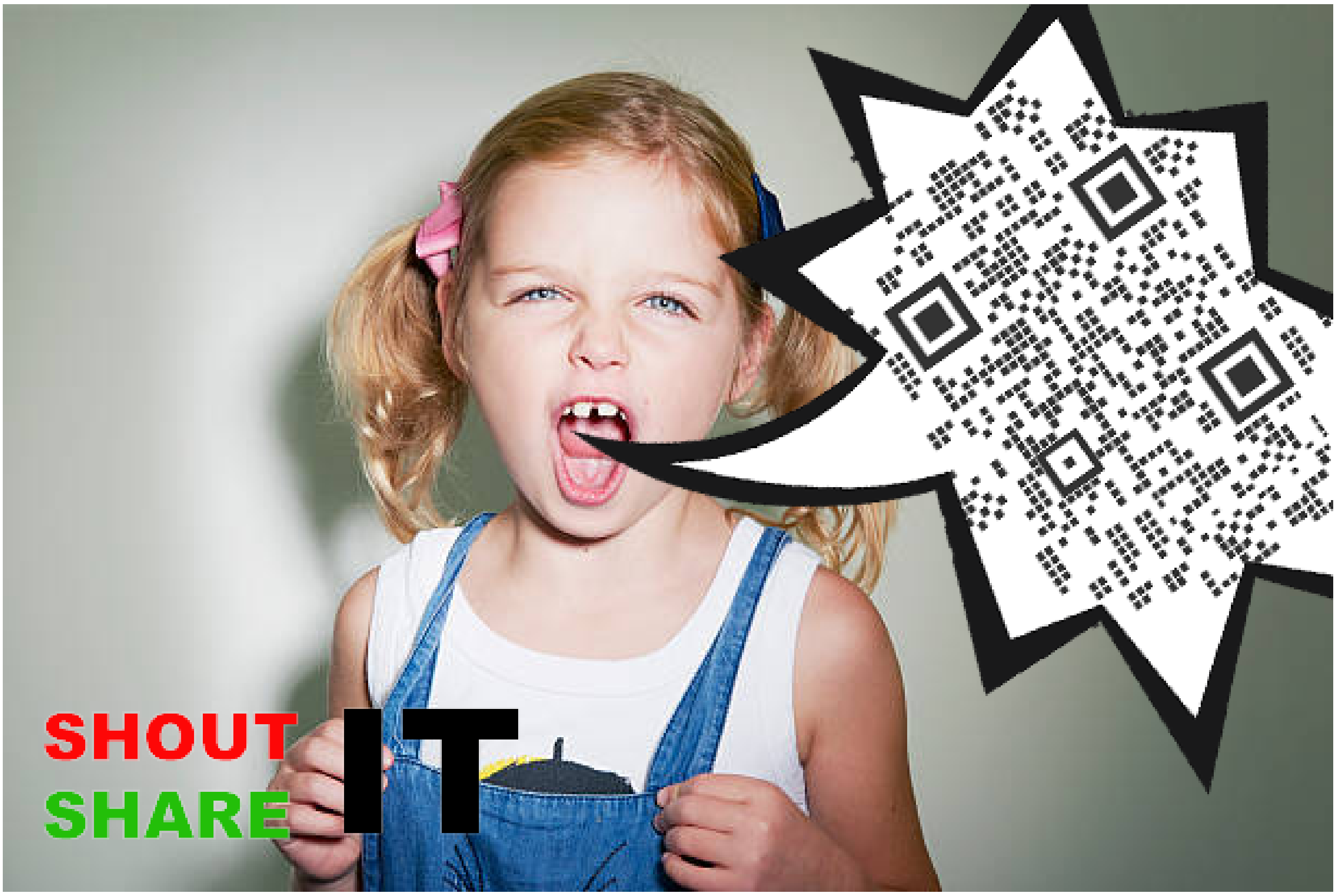
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To

Professor HENRY HAROLD WELCH PEARSON,

M.A., Sc.D., F.L.S.

HARRY BOLUS PROFESSOR OF BOTANY, CAPE TOWN

AND

DIRECTOR OF THE NATIONAL BOTANIC GARDEN

OF SOUTH AFRICA,

AS SUCCESSFUL IN HIS LEADERSHIP

OF BOTANICAL EXPEDITIONS

AS HE HAS BEEN GENEROUS

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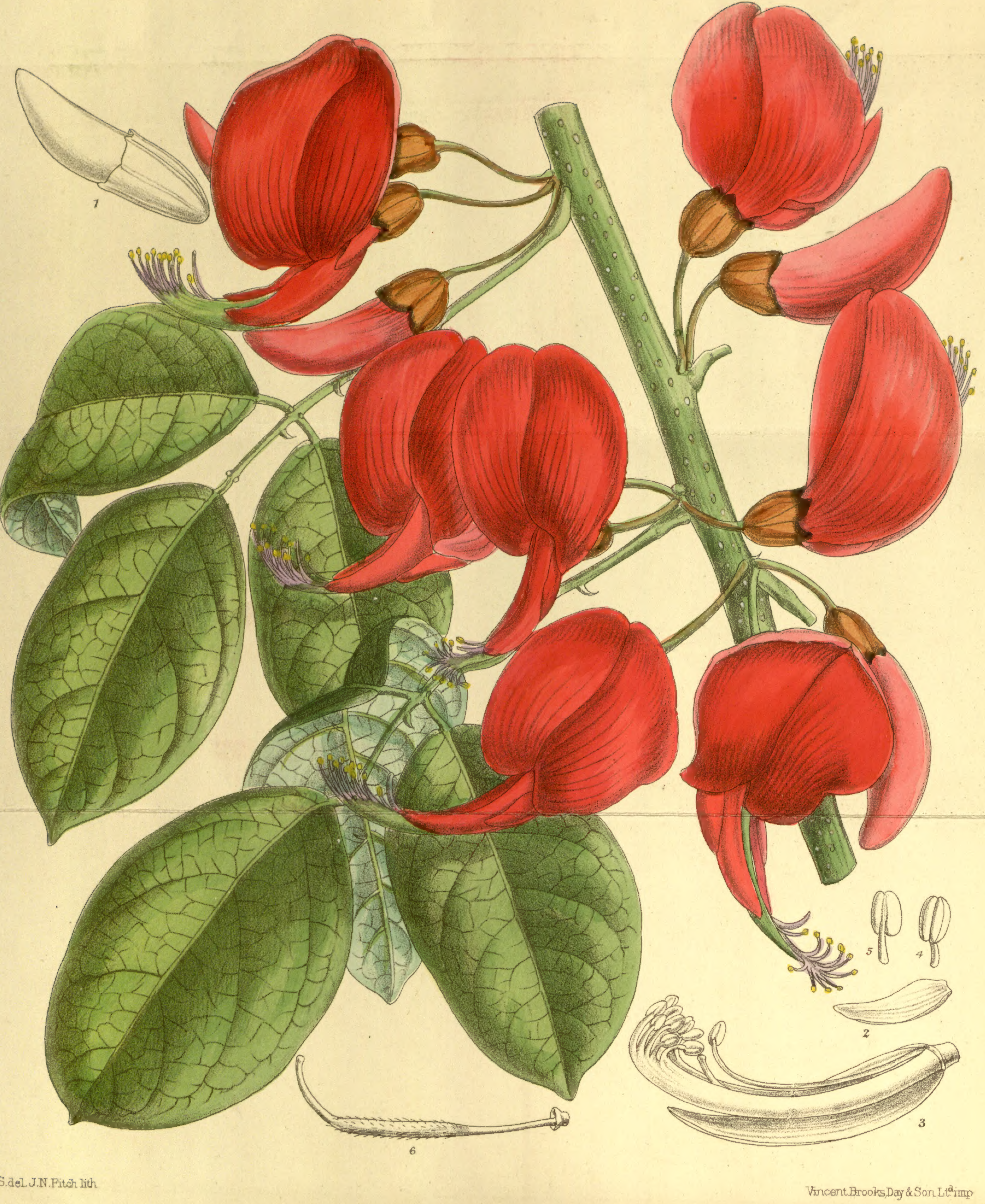

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TAB. 8532.

ERYTHRINA PULCHERRIMA.

South America?

LEGUMINOSAE. Tribe PHASEOLEAE.

ERYTHRINA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 531.

Erythrina pulcherrima, *Tod. Nuovi Gen. e Sp.* p. 70, *et in Ann. Sc. Nat.* sér. iv. vol. xx. p. 307, *et in Hort. Bot. Panorm.* t. xi.; ab *E. Crista-galli*, Linn., cui affinis, foliolis plus minusve ellipticis vel oblongis apice breviter obtuse acuminatis facile distinguenda.

Arbor parva. *Ramuli* teretes, glabri, virides, interdum rubro-brunneo-lineolati, lenticellis parum conspicuis hic illic instructi, aculeis sparsis. *Folia* pinnatim trifoliolata, petiolo 5·5–11 cm. longo basi incrassato terete vel superne canaliculato viridi aculeis validiusculis hic illic instructo suffulta. *Foliola* lateralia oblongo-ovata vel oblongo-elliptica, parum inaequilatera, apice breviter obtuse acuminata, basi late cuneata vel cuneato-rotundata, 6–9·5 cm. longa, 3·4–5·5 cm. lata, pagina utraque glabra, subtus pallidiora, costa subtus basin versus aculeo solitario saepe instructa, terminalia a lateralibus 2·7–3·5 cm. distantia, ex elliptica ad fere obovata, apice breviter obtuse acuminata, basi rotundata vel late cuneato-rotundata, 7–11 cm. longa, 4·5–7·3 cm. lata, pagina utraque glabra, inferiore aculeis 0–2 costa basin versus instructa; nervi laterales utrinsecus 7–8, supra conspicui, subtus prominuli, nervulis uti reticulatione conspicuis; petioluli 0·5–1 cm. longi, subglabri, supra leviter canaliculati; stipellae parvae, erectae. *Inflorescentia* axillaris, triflora; pedicelli 2·7 cm. longi, subglabri; bracteae bracteolaeque fugaces. *Calycis* carnosiusculi tubus 11 mm. diametro et longus, lobi breves, marcescentes. *Corollae* vexillum elliptico-obovatum, basi cuneatum, 5·2 cm. longum, 3·4 cm. latum; alae 2·1 cm. longae, medio 2·5 mm. latae; carina 4·4 cm. longa, medio 8·5 mm. lata. *Antherae* circiter 2 mm. longae. *Ovarium* albo-arachnoideum, stipiti subaequilongum, circiter 2 cm. longum, stylo breviusculo.—W. G. CRAIB.

This beautiful *Erythrina*, like several other similar species which have from time to time been introduced into Italian gardens, and have thence found their way into northern European collections, has an obscure history. Its original habitat was unknown to Professor Todaro when he first described it, nor has the doubt been yet cleared up, though it is probable that it is a native of Argentina and perhaps of the northern provinces of that state. The nearest ally of *E. pulcherrima* is *E. Cristi-galli*, Linn., a native of Brazil, figured at t. 2161 of this work, but our plant can be readily distinguished from the older species by the different shape of its leaflets. The material for our illustration has been

provided by a plant which has long been under cultivation in the Palm House at Kew, where it flowered for the first time in 1910. The Kew plant, which was obtained, by purchase, on the Continent, is about thirty feet in height, and judging from its behaviour here its cultural requirements are tropical. It does not flower at all freely at Kew, and in this respect it is in accord with the other arborescent species of *Erythrina* in the collection.

Description.—*Tree* up to 30 ft. high; branches terete, green, sometimes streaked with reddish-brown, here and there rather conspicuously lenticelled, sparingly prickly. *Leaves* pinnately 3-foliolate, petiole $2\frac{1}{4}$–$4\frac{1}{2}$ in. long, thickened at the base and there cylindric, upwards channelled, green, sparingly beset with stoutish prickles; lateral leaflets oblong-ovate or oblong-elliptic, somewhat unequal-sided, shortly obtusely acuminate, base wide-cuneate or somewhat rounded, $2\frac{1}{2}$–$3\frac{3}{4}$ in. long, $1\frac{1}{3}$–$2\frac{1}{4}$ in. wide, glabrous on both sides, rather paler beneath, the midrib underneath often with a single prickle near the base; terminal leaflet 1–$1\frac{1}{3}$ in. remote from the lateral, elliptic to obovate, shortly obtusely acuminate, base rounded or subacute, $2\frac{3}{4}$–$4\frac{1}{2}$ in. long, $1\frac{3}{4}$–$2\frac{3}{4}$ in., glabrous on both sides, but with usually 1–2 prickles on the midrib beneath near the base; lateral nerves 7–8 on each side, conspicuous above, somewhat raised beneath, secondary venation and fine reticulation conspicuous; petiolules $\frac{1}{4}$–$\frac{1}{3}$ in. long, nearly glabrous, slightly channelled on the upper side; stipels minute, erect. *Inflorescence* axillary, 3-flowered; pedicels over 1 in. long, nearly glabrous; bracts and bracteoles fugacious. *Calyx* somewhat fleshy; tube nearly $\frac{1}{2}$ in. long and almost as wide; lobes short, marcescent. *Standard* elliptic-obovate, cuneate at the base, over 2 in. long, $1\frac{1}{3}$ in. wide. *Wing-petals* over $\frac{3}{4}$ in. long, $\frac{1}{10}$ in. wide in the middle. *Keel* $1\frac{3}{4}$ in. long, $\frac{1}{3}$ in. wide in the middle. *Anthers* about $\frac{1}{12}$ in. long. *Ovary* white-arachnoid, with a large glabrous stipe, about $\frac{3}{4}$ in. long; style rather short.

Fig. 1, flower-bud; 2, wing-petal; 3, keel-petal and staminal sheath; 4 and 5, anthers; 6, pistil:—*all enlarged.*

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TAB. 8533.

GALTONIA PRINCEPS.

South Africa.

LILIACEAE. Tribe SCILLEAE.

GALTONIA, *Decne*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 809.

Galtonia princeps, *Decne in Flore des Serres*, vol. xxiii. (1880) p. 33; *Baker in Dyer, Fl. Cap.* vol. vi. p. 451; species *G. candicanti*, Decne, affinis, perianthii segmentis tubo brevioribus et staminibus prope basin tubi perianthii affixis differt.

Herba. *Bulbus* globosus, tunicatus. *Folia* 4–6, anguste lanceolata, acuminata, basi vaginantia, 4 dm. longa, 4 cm. lata, marginibus minutissine puberulis exceptis glabra. *Scapus* foliis longior, teres, glaber; pedicelli erecto-patentes, 3 cm. longi, fructiferi erecti, ad 7 cm. longi; bracteae ovatae, acuminatae, membranaceae, 3 cm. longae, 8 mm. latae; flores nutantes, distantes. *Perianthii* tubus oblongus, 12 mm. longus, 9 mm. diametro, extra viridis; lobi subpatentes, ovati, obtusi, 2 cm. longi, 1 cm. lati, candidi. *Stamina* paullo supra basin perianthii inserta; filamenta e basi dilatata subulata, 15 mm. longa; antherae oblongae, obtusae, basi profunde cordatae, 6 mm. longae. *Ovarium* oblongum, 7 mm. longum, viride; stylus cylindricus, 10 mm. longus; stigma minute trilobum.—*Hyacinthus princeps*, Baker in Saund. Ref. Bot. t. 175, et in Journ. Linn. Soc. vol. xi. p. 426.—C. H. WRIGHT.

The genus *Galtonia* was established by Professor Decaisne in 1880 to accommodate two species which Mr. Baker had already described and referred to *Hyacinthus*, Linn., as *H. candicans* and *H. princeps*; it is the second of these which forms the subject of our illustration. Decaisne proposed his new genus because the two species in question have more numerous seeds than any true *Hyacinthus*, because these seeds are angular and not turgid, and because the stature of the scape in a *Galtonia* is much higher than in a *Hyacinthus*. The view expressed by Decaisne was fully accepted by Baker who subsequently described a third species which differs from the others in having perianth-segments only half the length of the tube. That species, *G. clavata*, Baker, has been figured at t. 6885 of this work. The species now figured, *G. princeps*, has long been in cultivation at Kew, where it flowers every year under the cultural conditions which are suitable for the more popular and better known *G. candicans*. The home of *G. princeps* is the Eastern Region of South Africa, where on the Bazeia mountain and near Pietermaritzburg it attains altitudes of nearly 3,000 feet above sea-level. The original description was based upon a plant which flowered at Kew in 1870; since then it has been met with in various localities between the Transkei and Zululand. The specimen which supplied the material for our figure is one which was collected in Tembuland by Canon G. E. Mason, Principal of St. Bede's College at Umtata, and by his sister, Miss M. H. Mason, and was given by them to the Cambridge Botanic Garden, where it has flowered as freely as the species does at Kew. The most nearly allied species, the well-known *G. candicans*, occurs in Natal, the Orange River Colony and Aliwal North; it is readily distinguished from our plant by the characters already enumerated, and by its larger racemes with more numerous flowers.

DESCRIPTION.—*Herb*; bulb globose, tunicate. *Leaves* 4–6, narrowly lanceolate, acuminate, sheathing at the base, 1⅓ ft. long, 1½ in. wide, glabrous except for the very minutely puberulous margins. *Scape* longer than the leaves, cylindric, glabrous; pedicels somewhat spreading, 1¼ in. long, when in fruit erect, up to 3 in. long; bracts ovate, acuminate, membranous, 1¼ in. long, ⅓ in. wide; flowers nodding, rather remote. *Perianth* subcampanuliform; tube oblong, ½ in. long, over ⅓ in. wide, green outside; lobes somewhat spreading, ovate, obtuse, ¾ in. long, ⅕ in. wide, whitish. *Stamens* inserted some way above the perianth-base; filaments subulate from a dilated base, nearly ⅔ in. long; anthers oblong, obtuse, deep-cordate at the base, ¼ in. long. *Ovary* oblong, over ¼ in. long, green; style cylindric, ⅖ in. long; stigma minute, 3-lobed.

Figs. 1 and 2, anthers; 3, stigma:—*all enlarged.*

8534.

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TAB. 8534.

CARPINUS JAPONICA.

Central and Southern Japan.

CUPULIFERAE. Tribe CORYLEAE.

CARPINUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 405.

Carpinus (§ Distegocarpus) **japonica,** *Blume in Mus. Bot. Lugd.-Bat.* vol. i. p. 308; *Elwes & Henry in Trees of Gt. Brit. and Irel.* p. 528; species *C. cordatae*, Blume, quam maxime affinis sed foliis minoribus loboque bracteae basali duplo minore apte distinguenda.

Arbor decidua, sylvestris 15-metralis, caudice 4 dm. diametro, coma patente, cortice squamoso sulcatoque; ramuli hornotini pubescentes. *Folia* ovato-lanceolata vel ovato-oblonga, acuta vel acuminata, basi inaequilateraliter cordata, margine serrata vel nonnunquam dentibus minoribus interjectis, 5–12 cm. longa, 2–4·5 cm. lata; nervi paralleli, utrinsecus 16–24, subtus elevati, supra impressi; supra viridia secus costam pubescentia ceterum glabra, subtus pallidiora secus costam et in axillis nervorum pilosa; petiolus 6–12 mm. longus; stipulae paleaceae, lineares, 8–12 mm. longae, ciliatae. *Flores* monoici; masculi in amenta gracilia pendula pubescentia 5 cm. longa, feminei in amenta breviora terminalia aggregati; bracteae maris anguste ovatae, pilosae, singulae stamina numerosa subtendentes, feminei valde imbricatae, ovatae, grosse dentatae, basi induplicatae, accrescentes demum membranaceae, 2·5 cm. longae. *Filamenta* perbrevia; antherae purpurascentes, apice setulosae. *Ovarium* oblongum; styli 2, erecto-patentes. *Nucula* lobulo bracteae involuta; lobulus bracteae basi tantum adnatus, 4 mm. longus.—*Distegocarpus Carpinus*, Sieb. et Zucc. in Fl. Jap. Nat. Fam. vol. ii. p. 103. *Carpinus Carpinus*, Sargent in Gard. & For. vol. vi. p. 364; C. K. Schneider in Handb. der Laubholz. vol. i. p. 137.—W. J. BEAN.

The handsome Hornbeam now figured is interesting as belonging to a well marked section of the genus *Carpinus* which some authors have separated under the name *Distegocarpus*. The distinctive characters that separate *Distegocarpus* from *Eu-carpinus*, which includes all the true Hornbeams, are the more numerous parallel nerves, the closely imbricated fruiting bracts and the existence of a lobe or infolded base to each bract which completely covers the nutlet. The only other species in the section *Distegocarpus* is *C. cordata*, Blume, which is well distinguished by its larger and broader leaves with fifteen to twenty pairs of veins, and by the basal lobe of the bract being twice as large as in *C. japonica*, and being attached by its side as well as by its base. *C. japonica* appears to have first been introduced

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to Great Britain by the late Mr. Charles Maries in 1879, but most, if not all the examples now in cultivation came in 1895. In that year Kew received plants from the Arnold Arboretum and from a nursery at Tokyo. It was from a tree of Professor Sargent's sending, now 16 ft. high, that our figure was prepared, the fruit-clusters in June, 1912, the flowers in 1913. The tree is perfectly hardy, thriving well in stiff loam. In shape very graceful, for the spreading branches are pendulous at the ends, this is one of the most striking of Hornbeams in its many-ribbed leaves, and is an admirable tree for small gardens.

DESCRIPTION.—*Tree,* in Japan making a height of 50 ft., with a spreading head of branches and a trunk 5 ft. in girth; bark scaly and furrowed; branchlets hairy the first season. *Leaves* ovate-lanceolate to ovate-oblong, acute to acuminate, subcordate and unequal at the base, unequally often doubly serrate, 2–4½ in. long, ¾–1¾ in. wide; dark dull green and pubescent only on the midrib above, beneath rather paler, hairy on the midrib and in the nerve-axils; ribs parallel, in 16–24 pairs, very prominent beneath, impressed above; petiole ¼–½ in. long; stipules chaffy, linear, ⅓–½ in. long, ciliate. *Flowers* monoecious. *Male: Catkins* slender, pendulous, pubescent, 2 in. long; bracts narrowly ovate, hairy, subtending numerous stamens with short filaments; anthers purplish, hairy at the apex. *Female: Catkins* shorter than in male, terminal; bracts much imbricated, enlarging and becoming membranous in the fruiting stage, ovate coarsely toothed, 1 in. long, the base infolding; ovary oblong; styles 2, suberect. *Nutlet* covered by a lobe of the bract, ⅙ in. long, which is attached to the bract by its base only.

Fig. 1, male catkins; 2, male flowers; 3, an anther; 4, a female catkin; 5, female flowers; 6, vertical section of a female flower; 7, base of female bract with its basal lobe; 8, basal lobe of female bract with nutlet:—*all enlarged.*

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TAB. 8535.

PRIMULA PURDOMII.

West Kansu.

PRIMULACEAE. Tribe PRIMULEAE.

PRIMULA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 631.

Primula Purdomii, *Veitch ex Gard. Mag.* vol. lvi. p. 201 (icon. sine descr.); *Gard. Chron.* 1913, vol. liii. p. 192 (anglice); ibid. 1913, vol. liii. p. 200 (icon.); species *P. nivali*, Pall., peraffinis. sed corollae lobis magis rotundatis apice integris, stigmate grandi recedit.

Herba subacaulis. *Folia* oblanceolata, lanceolata vel oblongo-oblanceolata, basi in petiolum alatum attenuata vel interdum petiolo vix alato ad fere 3 cm. longo suffulta, apice obtusa vel acutiuscula, ad 11 cm. longa et 2·2 cm. lata. albo-farinosa, nervis vix conspicuis, margine revoluto subintegra vel denticulata. *Scapus* 12 cm. longus, superne praecipue summo apice farinosus, umbellam circiter 8-floram gerens; bracteae involucrales vix 1 cm. longae; pedicelli plerumque decurvi, ad 6 mm. longi, albo-farinosi. *Calyx* 1 cm. longus; lobi oblongo-lanceolati, acutiusculi, tubo subaequilongi, 2–2·5 mm. lati. *Corollae* tubus calycem 3 mm. superans, 4·5 mm. diametro; limbus patens, 2·3 cm. diametro, lobis ellipticis vel obovato-ellipticis apice rotundatis 8 mm. latis supra pilis paucis brevibus glanduloso-capitatis instructis. *Antherae* 2 mm. longae, fere sessiles. *Ovarium* 3 mm. altum, 2·5 mm. diametro, stylo 5 mm. longo, stigmate 1 mm. longo. *Capsula* exserta, ambitu oblonga, circiter 1·5 cm. longa, straminea, plurisulcata; semina parva, tuberculata.—W. G. CRAIB.

The Primula which forms the subject of our illustration is one which was raised by Messrs. J. Veitch & Sons from seeds collected on their behalf by Mr. W. Purdom, at Tao-chow in Western Kansu, where it grows at an elevation of 10–11,000 feet above the level of the sea. In consequence of the not inconsiderable number of Primulas at present finding their way into cultivation for the first time, the task of the formal descriptive botanist is not a very simple one. In that task he has of late been accorded the assistance of cultural authorities who now call for the use of a name for purposes of citation in connection with the issue of certain horticultural certificates. Instead of diminishing, this practice rather increases the difficulty of the descriptive botanist even when, as in the present instance, the nakedness of a particular name is partially concealed by the reproduction of photographs and the provision of a brief vernacular descriptive account by horticultural journals.

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That *P. Purdomii*, the plant in question, is a very pleasing addition to our garden Primulas is undoubted, but whether it is one which deserves recognition as a species apart from the rather variable North Temperate *P. nivalis*, Pall., figured at t. 1161 of this work, depends very largely upon the value as a distinctive character of the relatively much larger stigma met with in *P. Purdomii*. In any case there is no doubt that the latter is merely the geographical representative in Kansu of its Siberian and North American congener. Our plate has been prepared from a plant presented to the Kew collection by Messrs. Veitch which was grown in a cold frame and flowered freely, but failed to set seed, so that the fruit and seed shown in our illustration had to be added from material kindly supplied by that firm. Like most members of the "Nivalis" group of Primulas, *P. Purdomii* died after flowering. It is a plant of vigorous growth and robust habit which prefers a loamy soil.

DESCRIPTION.—*Herb*, acaulescent. *Leaves* oblanceolate, lanceolate or oblong-oblanceolate, narrowed at the base into a winged or wingless petiole over 1 in. long, obtuse or somewhat acute, up to $4\frac{1}{2}$ in. long, nearly 1 in. wide, white-mealy, nerves hardly visible, margin revolute, entire or denticulate. *Scape* nearly 5 in. long, mealy towards the top, bearing an 8-flowered umbel; involucral bracts about $\frac{1}{3}$ in. long; pedicels usually decurved, up to $\frac{1}{4}$ in. long, white-mealy. *Calyx* $\frac{2}{5}$ in. long; lobes oblong-lanceolate, somewhat acute, about as long as the tube, $\frac{1}{12}$–$\frac{1}{10}$ in. wide. *Corolla* lavender, becoming at length rosy-lilac; tube rather larger than the calyx, $\frac{1}{6}$ in. wide; limb spreading, nearly 1 in. across, lobes elliptic or obovate-elliptic, rounded, $\frac{1}{3}$ in. across, with a few short gland-tipped hairs above. *Anthers* $\frac{1}{12}$ in. long, subsessile. *Ovary* $\frac{1}{8}$ in. long, $\frac{1}{16}$ in. wide; style $\frac{1}{5}$ in. long; stigma $\frac{1}{24}$ in. long. *Capsule* exserted, oblong, about $\frac{2}{3}$ in. long, straw-coloured, grooved; seeds small, tuberculate.

Fig. 1, calyx and pistil; 2, corolla, cut vertically; 3, pistil; 4 and 5, fruit; 6, seeds:—*all enlarged except 4, which is of natural size.*

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TAB. 8536.

LONICERA DEFLEXICALYX.

China and Tibet.

CAPRIFOLIACEAE. Tribe LONICEREAE.

LONICERA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 5; *Rehder in Missouri Bot. Gard. Report,* 1903, p. 27.

Lonicera deflexicalyx, *Batalin in Act. Hort. Petrop.* vol. xii. p. 173; *Wolf in Gartenfl.* vol. xlii. p. 332; *Rehder,* l.c. p. 142; affinis *L. ovalis,* Batalin, sed foliis lanceolatis acuminatis bracteolis ovariis brevioribus facile distinguitur.

Frutex; ramuli patentes, graciles, glanduloso-puberuli. *Folia* lanceolata vel oblongo-lanceolata, basi rotundata vel subcordata, apice acuminata, mucronata, 4–7 cm. longa, 1·5–2·3 cm. lata, integra, tenuiter chartacea, supra parce pilosa, infra praesertim ad nervos pilosa; nervi laterales utrinsecus 9–10, angulo 45° a costa abeuntes, leviter arcuati, supra immersi, infra prominentes; petioli 2·5–4 mm. longi, pubescentes. *Pedunculi* axillares, solitarii, biflori, flore 2–3-plo breviores, glanduloso-puberuli; bracteae lineares, subobtusae, 2–3 mm. longae, fere glabrae; bracteolae ovario duplo breviores vel subaequilongae, basi connatae, truncatae vel obscure dentatae, ciliatae. *Receptacula* inter se libera, 2 mm. alta, glabra. *Calyx* fere ad basin fissus, segmentis membranaceis 2–3-dentatis parce pilosis. *Corolla* flava; tubus circiter 0·5 cm. longus, intra longe extra breviter pilosus et inferne glandulosus; labium inferum integrum, oblongum, apice rotundatum, tubo longius, superum 4-lobum, lobis ovatis apice rotundatis 3–4 mm. longis. *Stamina* exserta; filamenta circiter 0·5 cm. longa, basi pilosa; antherae 4–5 mm. longae, pallide virides. *Stylus* staminibus subaequilongus, pilosus, stigmate bilobo. *Baccae* (ex Batalin) luteo-aurantiacae, globosae, polyspermae; semina compressa, elliptica.—J. HUTCHINSON.

The Honeysuckle here figured belongs to a small group of species which is separated from the other members of *Lonicera,* subsection *Ochranthae,* Zabel, as amended by Rehder, chiefly by the form of the calyx which is usually more or less truncate. It is a species which occurs in Yunnan, Szechuan and Eastern Tibet, and is most nearly allied to *L. ovalis,* Batalin, which in turn is hardly by its description distinguishable from *L. trichosantha,* Bur. & Franch., a native of the same region. *L. deflexicalyx,* however, is readily distinguished by its narrower leaves. The plant from which the material for our figure has been derived was purchased when quite small from Mr. Spath of Berlin in 1908, and is now a bush 7 ft. in height and 15 ft.

across, with gracefully arching branches. *L. deflexicalyx* is undoubtedly one of the most ornamental of the bush Honeysuckles in this country, where, owing to the prevalence of late spring frosts, many members of this group of shrubs are as a rule more or less injured; sometimes their crop of flowers is entirely destroyed. Owing to its being later than the others of this group in breaking into growth, *L. deflexicalyx* usually escapes. The flowers, which are a rich yellow and are very plentiful, are all on the upperside of the twigs and show to great advantage. Like other species of the genus this one prefers a good loamy soil, abundant moisture and full sunshine. This species is easily increased by late summer cuttings.

DESCRIPTION.—*Shrub*; twigs spreading, slender, glandular-puberulous. *Leaves* lanceolate or oblong-lanceolate, acuminate, mucronate, rounded or subcordate at the base, $1\frac{1}{2}$–3 in. long, $\frac{2}{3}$–1 in. wide, entire, thinly papery, sparingly pilose above, pilose more particularly on the nerves beneath; lateral nerves 9–10 on each side of the midrib with which they make angles of 45°, slightly arched, sunk above and raised beneath; petiole 1–$1\frac{1}{2}$ in. long, pubescent. *Peduncles* axillary, solitary, 2-flowered, much shorter than the flowers, glandular-puberulous; bracts linear, somewhat obtuse, $\frac{1}{12}$–$\frac{1}{8}$ in. long, nearly glabrous; bracteoles sometimes nearly as long as the ovary, usually considerably shorter, connate at the base, truncate or obscurely toothed, ciliate. *Receptacles* not united to each other, $\frac{1}{12}$ in. long, glabrous. *Calyx* divided nearly to the base, segments membranous, 2–3-toothed, sparingly pilose. *Corolla* yellow; tube about $\frac{1}{5}$ in. long, pilose with long hairs within, shortly pilose outside and glandular near the base; lower lip entire, oblong, rounded at the tip, longer than the tube; upper lip 4-lobed, lobes ovate, rounded at the tip, $\frac{1}{8}$–$\frac{1}{6}$ in. long. *Stamens* exserted; filaments about $\frac{1}{5}$ in. long, hairy at the base; anthers $\frac{1}{6}$–$\frac{1}{5}$ in. long, pale green. *Style* nearly as long as the stamens, pilose; stigma 2-lobed. *Berries* orange-yellow, globose, many-seeded; seeds compressed, elliptic.

Fig. 1, a pair of flowers; 2, calyx and receptacle; 3, corolla, laid open; 4 and 5, anthers; 6, style and stigma;—*all enlarged.*

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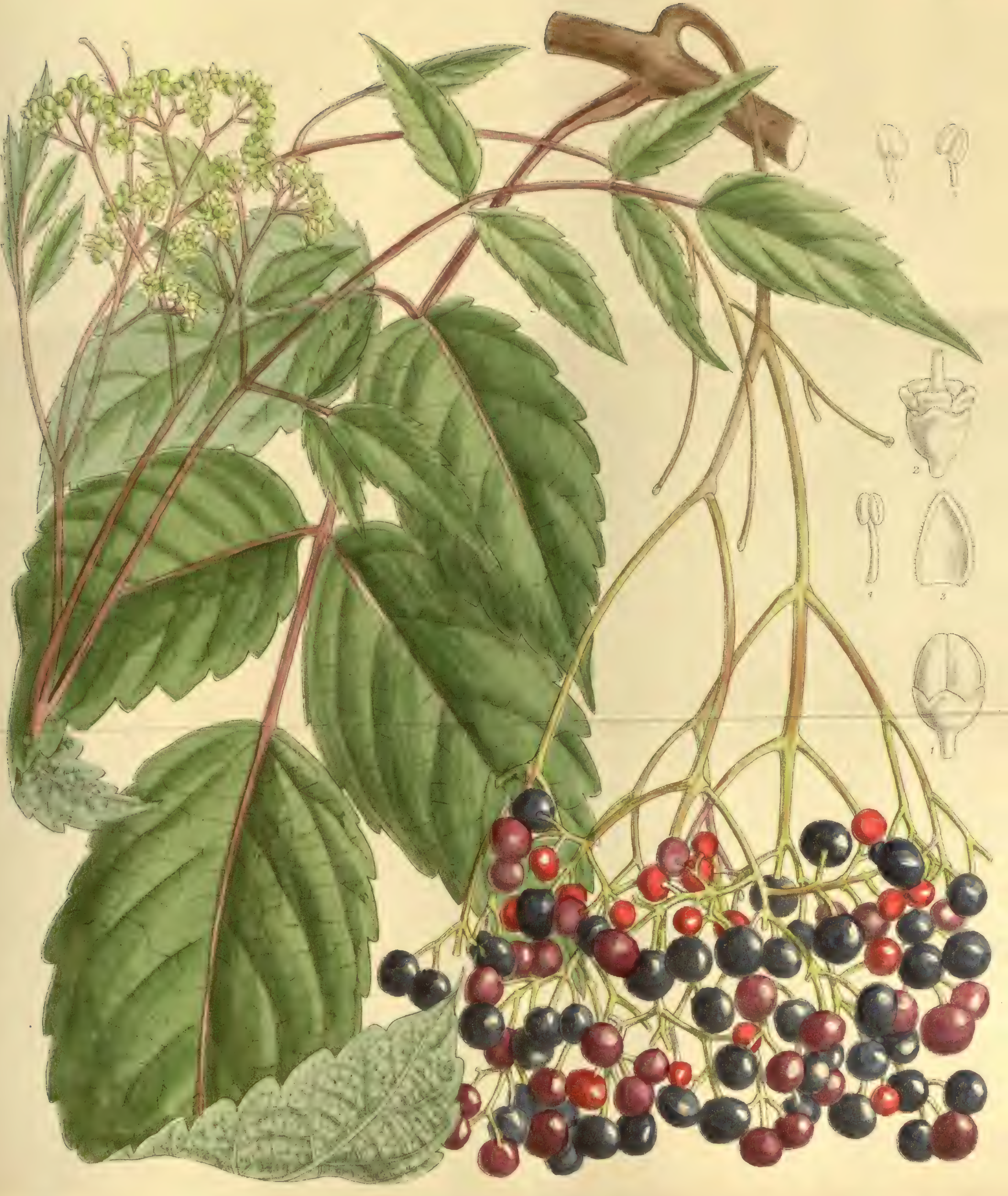

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Tab. 8537.

AMPELOPSIS MEGALOPHYLLA.

China.

AMPELIDACEAE.

Ampelopsis, *Michx*; *Planch. in DC. Monogr.* vol. v. p. 453; *Gilg in Engl. & Prantl, Nat. Pflanzenfam.* vol. iii. pars 5, p. 449.

Ampelopsis megalophylla, *Diels & Gilg in Engl. Jahrb.* vol. xxix. p. 466; *Gagnepain in Sargent, Pl. Wilson.* vol. i. p. 101; species *A. leeoidi*, Planch., affinis sed foliis inferioribus bi-tripinnatis foliolis magis serratis nervis magis conspicuis differt.

Frutex scandens, glaber, cirrhifer cirrhis oppositifoliis ramosis. *Folia* superiora simpliciter pinnata, inferiora bipinnata vel subtripinnata; petiolus rhachisque purpurei; foliola plus minusve petiolulata, terminale longe petiolulatum, ovata vel lanceolata, usque ad 13 cm. longa, 7 cm. lata, apice acute acuminata, basi inaequilateralia margine inferiore rotundato, infima basi subcordata, grosse serrata, supra viridia subtus glauca, axillis nervorum venularumque majorum minute pilosis. *Cymae* oppositifoliae, multiflorae; rhachis minute pilosa. *Flores* virides. *Calyx* amplus, membranaceus, lobis rotundatis. *Petala* patula, triangulari-ovata, acuta, marginibus papillosis. *Stamina* oppositipetala; antherae cordatae, apice leviter retusae. *Discus* intrastaminalis, elevatus, quinquelobatus lobis staminibus alternantibus. *Ovarium* biloculare; ovula pro loculo 2, erecta; stylus conspicuus, apice truncatus, stigmate terminali concavo. *Baccae* primum rubro-purpureae, demum nigrescentes, ad 1 cm. diametro.—*Vitis megaphylla*, Hort. ex Gard. Chron. 1903. vol. xxxiv. p. 180; J. H. Veitch in Journ. Roy. Hort. Soc. vol. xxviii. pp. 60, 395, ff. 16, 97.—T. A. Sprague.

The handsome Vine here figured was first cultivated in the garden of Mr. M. L. de Vilmorin at Les Barres, where it was raised from seed received by him from China in 1894, and where it flowered three years later. From Les Barres it was sent to Kew in 1907 under the name *A. cantoniensis*, Planch., a name which belongs, however, to another species which is not hardy in England. *A. megalophylla* is a native of Hupeh and Szechuan, and according to Dr. Schneider it also extends to Shensi. In 1901 it was introduced to European gardens a second time by Mr. E. H. Wilson on behalf of Messrs. Veitch & Sons. In some respects this is the most remarkable of all hardy vines, for though there are other species with pinnate and bipinnate leaves, recalling those of the genus *Leea*, there are none whose leaves are so large as in *A. megalophylla.* The leaves of greatest dimensions so far produced have approached three feet in length, and growths eight to ten feet long have been made during a single summer. In the south of England it succeeds well on a wall, but if grown in the open ground it needs a well-sheltered position in a sunny spot with a good loamy soil. The material for our figure we owe to the courtesy of Mr. L. Harcourt, in whose garden at Nuneham it thrives exceptionally well.

DESCRIPTION.—*Shrub*, climbing by means of glabrous, leaf-opposed, branching tendrils. *Leaves* compound, the upper simply, the lower 2–3-pinnate; petiole and rhachis purple; leaflets more or less petiolulate, the terminal petiolule elongated, ovate or lanceolate, acutely acuminate, base unequal, the lower side rounded the upper cuneate, at point of union with the petiolules slightly subcordate, margin coarsely toothed, 5 in. long, 2½–3 in. wide, green above, glaucous beneath, minutely hairy in the angles of the main-nerves and larger veins. *Cymes* leaf-opposed, many-flowered, the rhachis finely pilose. *Flowers* green. *Calyx* large, membranous, lobes rounded. *Petals* spreading, triangular-ovate, acute, their margins papillose. *Stamens* opposite the petals; anthers cordate, slightly retuse at the tip. *Disk* intrastaminal, raised, 5-lobed; lobes alternate with the stamens. *Ovary* 2-celled; ovules 2 to each cell, erect; style conspicuous, truncate at the tip; stigma terminal, concave. *Fruit* at first red-purple, at length blackish, about ⅓ in. across.

Fig. 1, flower-bud; 2, the same, petals and stamens removed; 3, petal, from within; 4, stamens; 5 and 6, anthers:—*all enlarged.*

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TAB. 8538.

ACTINIDIA CHINENSIS.

China.

TERNSTROEMIACEAE. Tribe SAURAUJEAE.

ACTINIDIA, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 184.

Actinidia chinensis, *Planch. in Hook. Lond. Journ. Bot.* vol. vi. p. 303; *Oliver in Hook. Ic. Pl.* t. 1593; *Dunn in Journ. Linn. Soc., Bot.* vol. xxxix. p. 408; foliis suborbicularibus vel late ovatis basi cordatis vel rotundatis subtus tomentosis distincta.

Frutex scandens. *Rami* juniores hispidi, seniores glabrescentes. *Folia* longipetiolata, dimorpha; folia ramulorum sterilium majuscula, late ovata vel elliptica, breviter acuminata vel cuspidata; folia ramulorum floriferorum suborbicularia, apice breviter cuspidata rotundata vel retusa, basi plus minusve cordata, 6–12 cm. diametro, venulis productis denticulata, supra puberula nervis densius induta, subtus dense molliter pubescentia nervis prominentibus; petioli 3·5–6 cm. longi, dense hirsuti. *Cymae* in axillis foliorum delapsorum ortae, pauciflorae; pedicelli circiter 1·5 mm. longi, hirsuti. *Flores* unisexuales, aurantiaci, 4–5 cm. diametro. *Flores* ♂: *Sepala* ovato-oblonga, extra brunneo-tomentosa. *Petala* latissime obovata, breviter unguiculata. *Stamina* numerosa; filamenta filiformia; antherae sagittatae. *Ovarii rudimentum* dense lanatum, multiloculatum loculis 20–25 minutis; styli totidem, lineares. *Flores* ♀ (alabastra tantum cognita): *Staminodia* numerosa. *Ovarium* subglobosum, tomentosum, usque ad 30-loculatum; styli in alabastro recurvati. *Baccae* ellipsoideae, tomentosae, circiter 4 cm. longae, calyce persistente reflexo. *Semina* oblongo-ellipsoidea, 2–2·5 mm. longa, reticulato-foveolata.—T. A. SPRAGUE.

The genus *Actinidia*, to which the subject of our illustration belongs, is one as to the position of which there has been some debate. In the *Genera Plantarum* it was referred by Bentham and Hooker to the natural family *Ternstroemiaceae*, but in the *Natürlichen Pflanzenfamilien* it was transferred by Gilg to the *Dilleniaceae*. Dunn, who has recently monographed the genus *Actinidia* and re-investigated its affinities, has once more included it in the *Ternstroemiaceae*, relying largely in so doing upon its versatile anthers, numerous seeds unprovided with an aril, and moderately large embryo. The species of *Actinidia* are said to be polygamous or dioecious; according to Schneider *A. chinensis* is dioecious, and this statement is apparently correct, for the plant figured at t. 1593 of the *Icones Plantarum* bears young flowers which appear to be functionally female, whereas the plant which has supplied

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the material for our plate bears functionally male flowers. This latter plant was obtained in 1905 from Messrs. J. Veitch & Sons, and now grows as a climber in the Himalayan house, the stems being some twenty feet long. Under the conditions thus provided it thrives luxuriantly and makes strong yearly shoots some six feet in length. These shoots are cut back to spurs on which flowers subsequently develop in May. There being but one plant in the collection it has not yet been possible to test its hardiness. The leaves are larger and more decorative than in any other cultivated *Actinidia*. According to Wilson, by whom it was introduced on behalf of Messrs. Veitch, *A. chinensis* bears an edible fruit with green, subacid, palatable pulp, in flavour resembling the gooseberry. The fruits vary both in size and in hairiness.

DESCRIPTION.—*Shrub*, climbing; young twigs hispid, adult twigs glabrescent. *Leaves* long-petioled, dimorphic; those of the sterile twigs rather large, wide ovate or elliptic, shortly acuminate or cuspidate; those of the floral twigs suborbicular, shortly cuspidate and rounded or retuse, more or less cordate at the base, $2\frac{1}{4}$–5 in. long, margin finely toothed, each tooth with an excurrent veinlet; puberulous above, especially on the nerves; softly pubescent beneath with raised nerves; petiole $1\frac{1}{4}$–$2\frac{1}{2}$ in. long, densely hirsute. *Cymes* springing from the axils of fallen leaves, few-flowered; pedicels about $\frac{2}{3}$ in. long, hirsute. *Flowers* 1-sexual, orange-yellow, $1\frac{3}{4}$–2 in. wide. *Male*: *Sepals* ovate-oblong, brown-tomentose externally. *Petals* very wide obovate, shortly clawed. *Stamens* very numerous; filaments filiform; anthers sagittate. *Rudimentary ovary* densely woolly, many-celled, cells 20–25, minute, styles as many as the cells, linear. *Female* (only seen in bud): *Staminodes* very numerous. *Ovary* subglobose, tomentose, up to 30-celled; styles recurved in bud. *Fruit* ellipsoid, tomentose, about $1\frac{1}{2}$ in. long, persistent calyx reflexed. *Seeds* oblong-ellipsoid, $\frac{1}{12}$–$\frac{1}{10}$ in. long, foveolate-reticulate.

Fig. 1, calyx and barren pistil; 2 and 3, anthers; 4, section of barren ovary:—*all enlarged.*

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TAB. 8539.

SMILACINA PANICULATA.

Guatemala and Southern Mexico.

LILIACEAE. Tribe POLYGONATEAE.

SMILACINA, *Desf.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 770.

Smilacina paniculata, *Mart. et Gal. in Bull. Acad. Brux.* vol. ix. p. 2; *Kunth, Enum. Plant.* vol. v. p. 151; *Hemsl. in Biol. Centr.-Amer.* vol. iii. p. 358; species *S. thyrsoideae,* Hemsl., affinis, inflorescentiae ramis brevioribus, floribus paucioribus e pedicellis longioribus suberectis orientibus distinguitur.

Herba glabra. *Caulis* erectus, cylindricus, virescens. *Folia* ovato-lanceolata, longe acuminata, 13 cm. longa, prope basin 4 cm. lata, ima basi constricta; nervi primarii 5–7, nervulis pluribus tenuibus connexi. *Panicula* terminalis, racemosim ramosa, 6 cm. longa lataque, omnino nivea; bracteolae minutae, deltoideae; pedicelli circiter 1 cm. longi; flores 1 cm. diametro. *Perianthii* segmenta elliptica, apice rotundata, patentia. *Filamenta* aequilonga, quam perianthii segmenta paullo breviora. *Ovarium* ovoideum; stylus columnaris, staminibus aequilongus; stigma punctiforme.—*Tovaria paniculata,* Baker in Journ. Linn. Soc., Bot., vol. xiv. p. 568.—C. H. WRIGHT.

The genus *Smilacina*, which includes some twenty species, extends from the north temperate and subarctic regions of Japan, Siberia and North America as far south as to Arabia in the Old World and Guatemala in the New. One of the species, *S. bifolia*, Desf., is a rare British plant. Three members of the genus have already been figured in this work, but all of them under different generic names. At t. 899 will be found *S. Forskaliana*, Schultes f., a native of Arabia, under the name *Convallaria racemosa*, Forsk.; this resembles the subject of our illustration, but differs in having very short pedicels. At t. 1043, under the name *Convallaria stellata*, Linn., a figure was given of *S. stellata*, Desf., the Star-flowered Lily of the Valley, from North America, which was introduced into English gardens in 1633. At t. 6313, under the name *Tovaria oleracea*, Baker, is given a portrait of the Himalayan *S. oleracea*, Hook. f. & Thoms., a species with short hairy pedicels. The generic name which was used by Mr. Baker was proposed by Necker in 1790, and is older by seventeen years than the name *Smilacina*, now accepted, which was introduced by Desfontaines in

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1807, but it is in turn antedated by the name *Vagnera*, employed in 1763 by Adanson. The species now figured, *S. paniculata*, which is a native of Guatemala and the extreme south of Mexico, is most closely allied to the Mexican *S. thyrsoidea*, Hemsl., but is readily distinguished by the much shorter branches of the inflorescence and the comparatively fewer flowers borne on much longer pedicels. In *S. thyrsoidea* too the pedicels are subpatent, a circumstance which imparts a distinctive facies to the plant. The specimen from which the material for our plate has been obtained is one introduced and grown by Messrs. Sander & Sons, St. Albans, with whom it flowered in March, 1913. From the snowy whiteness of all parts of the inflorescence, which affords a pleasant contrast to the green foliage, the species is likely to be a distinct accession to collections under glass, but it cannot take a place alongside its more hardy congeners, like *S. racemosa*, *S. stellata*, *S. trifolia* and others which are grown at Kew in the open border along with the common Solomon's Seal, *Polygonatum multiflorum*, All., a member of a genus closely allied to *Smilacina*.

DESCRIPTION.—*Herb*, glabrous; stem erect, cylindric, greenish. *Leaves* ovate-lanceolate, long acuminate, 5–6 in. long, above the base 1½ in. wide, at the very base much narrowed; main-nerves 5–7, with numerous slender intervening nervules. *Panicle* terminal, racemosely branched, 2¼ in. long, and as much across; all parts snowy white; bracteoles minute, deltoid; pedicels about ⅓ in. long; flowers about ⅓ in. across. *Perianth-segments* elliptic, rounded at the tip, spreading. *Filaments* subequal, rather shorter than the perianth-segments. *Ovary* ovoid; style columnar, as long as the stamens; stigma minute.

Fig. 1, a flower; 2 and 3, anthers; 4, pistil:—*all enlarged.*

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TAB. 8540.

RONDELETIA CORDATA.

Guatemala.

RUBIACEAE. Tribe CONDAMINEEAE.

RONDELETIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 48.

Rondeletia cordata, *Benth. Pl. Hartweg.* p. 85; *Hemsl. Biolog. Centr.-Amer.* vol. ii. p. 18; affinis *R. amoenae*, Hemsl., foliis parce pilosis vel glabrescentibus, inflorescentiis minopere pubescentibus, calycis lobis minoribus differt.

Frutex 1–2·5 m. altus; rami 2–3-furcati, juniores appresse setoso-pilosi. *Folia* ovata vel elliptico-ovata, subacute acuminata, basi leviter cordata vel rotundata, 6–17 cm. longa, 3–9 cm. lata, integra, chartacea, juniora praesertim ad nervos parce pilosa, demum fere glabra, ciliata; nervii laterales utrinsecus circiter 8, arcuati, utrinque distincti, infra prominentes, marginem versus minime conspicui; petioli circiter 3 mm. longi, setuloso-puberuli; stipulae persistentes, mox reflexae, ovato-lanceolatae, obtusae vel subacutae, 1·3–1·7 cm. longae, basi 0·7–1 cm. latae, coriaceae, appresse pubescentes. *Cymae* terminales, corymbosae, multiflorae, usque ad 12 cm. diametro; bracteae ovato-lanceolatae, obtusae vel subacutae, ad 1·2 cm. longae et 0·5 cm. latae, coriaceae, extra dense appresse pilosae; bracteolae parvae. *Flores* tubis corollae purpureo-rubris limbis roseis. *Receptaculum* campanulatum, 1·5 mm. altum, albo-puberulum. *Calycis* dentes ovati, obtusi, 0·5 mm. longi, extra puberuli. *Corollae* tubus cylindricus, circiter 1 cm. longus, extra setuloso-puberulus, intus pilosus, fauce flavo-villoso; limbus 1·3–1·5 cm. expansus; lobi 5 vel 6, oblongi, apice rotundati, 2·5 mm. longi, 1·75 mm. lati. *Antherae* fauce vel medio tubi insertae, 2 mm. longae; filamenta 1·5 mm. longa, glabra. *Discus* annularis, glaber. *Stylus* quam tubus duplo brevior vel longior et exsertus, bilobus, glaber. *Capsula* subglobosa, leviter biloba, 0·5 cm. diametro, setuloso-puberula. *Semina* minuta.—*Rogiera cordata*, Planch. in Fl. des Serres, vol. v. sub. t. 442; Henfrey in Moore & Ayres Gard. Mag. Bot. 1851, p. 89, cum ic. *R. thyrsiflora*, Hort. ex Henfrey, l.c.—J. HUTCHINSON.

The Rubiaceous genus *Rondeletia* includes some seventy species, confined to Tropical America and the West Indies, and most numerous in Central America and Colombia. The one now figured, a native of Guatemala, is an old garden plant, first introduced into cultivation in this country in 1844, and raised from a seedling which appeared in the soil adhering to some imported orchids grown by Mr. J. Anderson, of Holme, Regent's Park. It was long known in collections as *Rogiera cordata*, the fact that it is really a *Rondeletia* being obscured because Bentham in his original account described the flowers as tetramerous. The misunderstanding was adjusted by Planchon. Actually both pentamerous and hexamerous flowers occur in the same

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inflorescence, and, as Hemsley has pointed out, they are dimorphic as regards the relative length of the style and the position of the stamens; all the flowers of one inflorescence have the style exserted and the stamens included in the tube; in another inflorescence these conditions are reversed. The plant from which the material for our figure has been obtained is one which has been grown in a border in a greenhouse at Kew. Here it thrives well and grows into a shapely bush some six feet high which flowers freely every spring. It bears pruning well and the shoots root readily if set in a propagating frame in autumn.

Description.—*Shrub* 4–6 ft. high; branches 2–3-furcate, when young adpressed-setose. *Leaves* ovate or elliptic-ovate, sharply acuminate, base slightly cordate or rounded, 2½–7 in. long, 1¼–3½ in. wide, entire, papery, when young sparingly hairy especially on the nerves, soon nearly glabrous, ciliate; lateral nerves about 8 on each side, arched, distinct above, more prominent beneath, towards the margin somewhat indistinct; petioles about 1½ lin. long, setulose-puberulous; stipules persistent, soon reflexed, ovate-lanceolate, obtuse or subacute, ½–⅔ in. long, at the base ⅓–⅖ in. wide, coriaceous, adpressed-pubescent. *Cymes* terminal, corymbose, many-flowered, up to 4½ in. wide; bracts ovate-lanceolate, obtuse or subacute, up to ½ in. long and ⅕ in. wide, coriaceous, densely adpressed hairy outside; bracteoles small. *Flowers* with reddish-purple corolla-tube and rose-coloured corolla-lobes. *Receptacle* campanulate, under a line deep, white-puberulous. *Calyx* with very short ovate-obtuse lobes puberulous outside. *Corolla* with a cylindric tube about ⅓ in. long, setulose-puberulous outside, pilose within; throat yellow-villous; limb ½–⅔ in. across, lobes 5–6, oblong with rounded tips, over 1 lin. long, under 1 lin. wide. *Anthers* attached in the throat or about the middle of the corolla-tube, 1 lin. long; filaments under 1 lin. long, glabrous. *Disk* annular, glabrous. *Style* half as long as the tube in one state or longer than the tube and exserted in another, 2-lobed, glabrous. *Capsule* subglobose, slightly 2-lobed, ⅕ in. across, setulose-puberulous. *Seeds* minute.

Fig. 1, calyx and pistil; 2, section of calyx, showing disk; 3, corolla laid open; 4, hairs from inside of corolla; 5 and 6, stamens:—*all enlarged.*

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TAB. 8541.

VIOLA GRACILIS.

Asia Minor and Balkan Peninsula.

VIOLACEAE. Tribe VIOLEAE.

VIOLA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 117.

Viola gracilis, *Sibth. et Sm. Fl. Graec. Prodr.* vol. i. p. 146; *Becker in Beih. Bot. Centralbl.* vol. xviii. pars 2, p. 369; et l.c. xxvi. pars 2, pp. 330; affinis *V. calcaratae*, Linn., a qua petalis lateralibus prorsum inclinatis statim distinguitur.

Herba caulibus suberectis 2–4 cm. altis glabris. *Folia* alterna, stipulata, longiuscule petiolata, supra leviter concava, inferiora elliptico-ovata, apice rotundata, 1 cm. longa, 5–8 mm. lata, crenata, superiora ovato-oblonga vel oblonga, apice obtusa vel vix apiculata, basi in petiolum cuneatim angustata, 1·5–2 cm. longa, 5–6 mm. lata; stipulae magnae, pinnatifido-laciniatae lobo terminali magno obtuso laciniis satis angustis acutis. *Pedunculi* solitarii, ex axillis superioribus orti, 7–9 cm. longi, superne bibracteolati bracteolis hyalinis inferne laceratis. *Sepala* basi in appendicem producta, in toto circiter 1 cm. longa, duo anteriora lanceolata, acuta, trinervia appendice quadrato subtruncato 3 mm. longo, duo lateralia conformia appendice dentato, posterius ovato-lanceolatum appendice triangulari. *Corolla* violacea limbo circiter 3 cm. longo, 2·5 cm. lato; petala superiora suboblique inserta, leviter reversa, obovata, vix 2 cm. longa, 1·5 cm. lata; petala intermedia oblique prorsum inclinata, limbo cymbiformi 1·3 cm. longo, ungue 4 mm. longo crista fimbriata; petalum inferius breviter unguiculatum, basi calcaratum, late obdeltoideum, in basin cristatam cuneatum, 1·4 cm. longum, 1·7 cm. latum, ungue circiter 3 mm. longo supra utrinque villoso, calcare gracile 1 cm. longo. *Antherae* sessiles, conniventes, introrsae, connectivis superne in appendicem late ovatum rotundatum membranaceum aurantiacum productis, duo inferiorum basi in appendicem filiformem 4 mm. longum intra calcar productis. *Ovarium* ovoideum; stylus basi geniculatus, abhinc ad apicem subglobosum sensim ampliatus; stigma cupulare labio antico valde papillato.—T. A. SPRAGUE.

The Violet which forms the subject of our illustration is one which was originally discovered on Mount Olympus in Bithynia, but which, as Becker has shown, occurs also in Macedonia and, according to the same authority, may possibly also occur in Montenegro. It was for a long time believed by authorities so competent as Boissier and Halacsy to be a native also of Greece, but Becker has given good reasons for the treatment of the Greek specimens named *V. gracilis* by Boissier as the basis of a distinct variety of the somewhat different species *V. heterophylla*, Bertol. The species now figured, *V. gracilis*, is a hardy

perennial which may be grown in the ordinary herbaceous border in light rich soil and can be increased by seeds, cuttings or divisions. It also proves a useful denizen of a half-shady patch in the Rock Garden, where it may be expected to flower freely during the months of spring and early summer. The material for our plate was obtained from a plant so grown which had been obtained for the Kew collection by purchase in 1907.

DESCRIPTION.—*Herb,* stems suberect, $\frac{3}{4}$–$1\frac{1}{2}$ in. high, glabrous. *Leaves* alternate, stipulate, rather long-stalked, slightly concave above, the basal ones elliptic-ovate, rounded at the tip, $\frac{2}{5}$ in. long, $\frac{1}{5}$–$\frac{1}{3}$ in. wide, crenate, the upper ovate-oblong or oblong, obtuse or barely apiculate at the tip, cuneately narrowed into the petiole, $\frac{2}{3}$–$\frac{3}{4}$ in. long, $\frac{1}{5}$–$\frac{1}{4}$ in. wide; stipules large, pinnatifid-laciniate, with a large blunt terminal lobe and rather narrow acute segments. *Peduncles* solitary in the axils of the upper leaves, 3–$3\frac{1}{2}$ in. long, 2-bracteolate above, bracteoles hyaline, lacerate below. *Sepals* produced at the base in a spur, in all about $\frac{2}{5}$ in. long, the two anterior lanceolate, acute, 3-nerved, with a quadrate somewhat truncate appendage $1\frac{1}{2}$ lin. long, the two lateral similar but with a dentate appendage, the posterior ovate-lanceolate with a triangular appendage. *Corolla* violet, limb about $1\frac{1}{4}$ in. long, 1 in. wide; upper petals somewhat obliquely inserted, slightly reversed, obovate, under $\frac{3}{4}$ in. long, $\frac{2}{3}$ in. wide; intermediate petals obliquely inturned, limb cymbiform, over $\frac{1}{2}$ in. long, claw $\frac{1}{6}$ in. long with fimbriate crest; lower petal short-clawed, spurred at the base, broadly obdeltoid, cuneately narrowed into the crested base, over $\frac{1}{2}$ in. long, nearly $\frac{2}{3}$ in. wide, claw about $\frac{1}{8}$ in. long, villous upwards on both faces, spur slender, $\frac{2}{5}$ in. long. *Anthers* sessile, connivent, introrse, the connectives produced upwards as a wide, ovate-rounded, membranous, orange-yellow appendage, two of the lower being also produced within the spur as a filiform appendage $\frac{1}{6}$ in. long. *Ovary* ovoid; style geniculate at the base, thence gradually widened upwards to the subglobose tip; stigma cup-shaped, its anterior lobe strongly papillose.

Fig. 1, stipule; 2, flower-bud; 3, spur; 4, stamens and pistil; 5, an anterior stamen; 6, pistil:—*all enlarged.*

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> But there was planted or grew natural."

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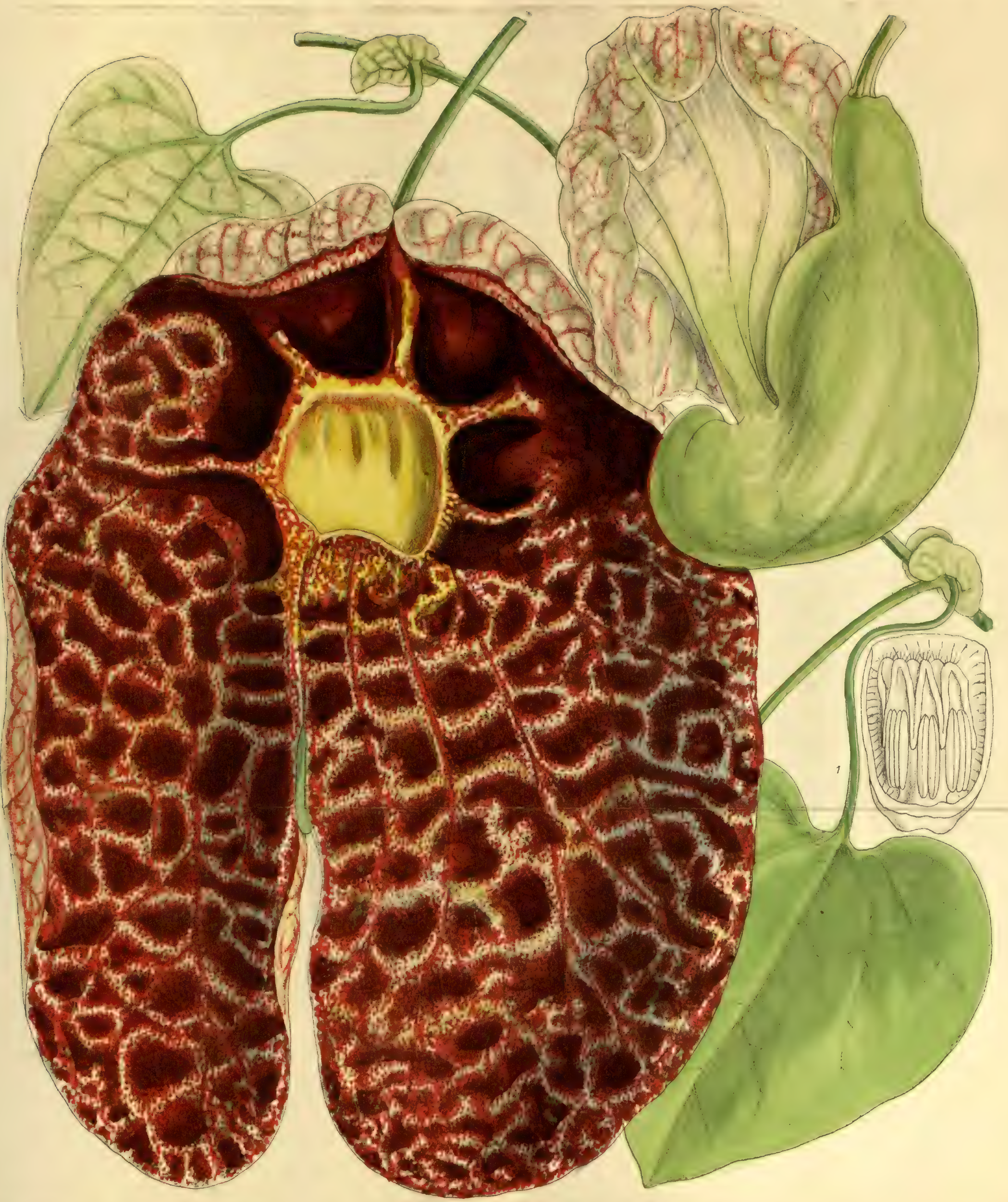

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TAB. 8542.

ARISTOLOCHIA GIGANTEA.

Brazil.

ARISTOLOCHIACEAE.

ARISTOLOCHIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 123.

Aristolochia gigantea, *Mart., Nov. Gen. et Sp.* vol. i. p. 75, t. 48; *Duchartre in DC. Prodr.* vol. xv. pars i. p 474; *M. T. Masters in Mart. Flor. Bras.* vol. iv. pars ii. p. 89; *Engl. & Prantl, Nat. Pflanzenfam.* vol. iii. pars i. p. 265, fig. 169 D; species *A. cordiflorae,* Mutis, affinis, foliis non acuminatis, perianthiique fauce omnino lutescente differt.

Frutex scandens. *Caulis* volubilis, lignosus, leviter sulcatus, glaber. *Folia* late ovato-cordata, subacuta, membranacea, glabra, pedatim 3–7-nervia, 8–10 cm. longa, 4–9·5 cm. lata; petioli tenues, usque ad 7 cm. longi; stipulae reniformes, 2 cm. latae, integrae, glabrae. *Flores* solitarii, magni, axillares. *Perianthium* basi inflatum, 6 cm. longum, viride vel violaceo-tinctum; pars media constricta, curvata, 4 cm. vel ultra longa, fauce intus lutescens, velutina; limbus ellipticus, profunde cordatus, patens, ecaudatus, 22 cm. longus, 16 cm. latus, brunneo-purpureus, pallide flavo-reticulatus. *Columna* 12 mm. longa. *Stamina* 6; antherae obtusae, lutescentes, lobis basi discretis. *Ovarium* tortum, costatum, glabrum; stigma 6-partitum, laciniis lineari-lanceolatis, subobtusis.—*Howardia gigantea,* Klotzsch in Monatsber. Acad. Berl. 1859, p. 610, ref. Bot. Mag. t. 4221 excl.
—C. H. WRIGHT.

The *Aristolochia* which forms the subject of our plate was first collected by von Martius in the course of his travels in the Brazilian provinces of Bahia and Minas Geraes between 1817 and 1820, and was described by its discoverer. The original description is accompanied by a figure by Zuccarini in which the cream-coloured reticulations on the perianth are not shown. The species from Pernambuco which was figured at t. 4221 of this work as *A. gigantea* is quite distinct from the original *A. gigantea,* and was subsequently described as *A. grandiflora,* var. *Hookeri,* by Duchartre; it is readily distinguished from our present plant by the apex of the perianth limb being long-caudate and not obtuse. The plant from which the material for our illustration has been derived is one that was presented to the collection at Kew in 1910 by Sir Frank Crisp; at the time of its receipt it was believed to be *A. clypeata,* Linden & André, a closely allied species from New Grenada,

figured at t. 7512 of this work. *A. gigantea* grows vigorously in the Palm House at Kew, where, trained against the roof, its annual shoots, which spread from a woody stem with corky bark, extend to a length of 15 feet or more. In Brazil the flowering season of this species is in March, but at Kew the flowers develop in August. The flowers are fragrant. This is the only species of *Aristolochia* in cultivation of which the same can be said; most of them have a disagreeable odour.

DESCRIPTION.—*Shrub*; stem twining, woody, somewhat channelled, smooth. *Leaves* wide ovate-cordate, subacute, membranous, glabrous, pedately 3–7-nerved, 3–4 in. long, 1½–3¾ in. wide; petioles slender, up to 2¾ in. long; stipules reniform, ¾ in. wide, entire, glabrous. *Flowers* solitary, large, axillary. *Perianth* inflated at the base, 2½ in. long, green or tinged with violet, middle portion constricted, curved, 1½ in. long, throat yellowish within, velvety; limb elliptic, deeply cordate, spreading, without a tail, 9 in. long, 6–6½ in. wide, brownish-purple with pale yellow reticulations. *Column* ½ in. long. *Stamens* 6; anthers obtuse, yellowish, lobes distinct below. *Ovary* contorted, ribbed, glabrous; stigma 6-partite, lobes linear-lanceolate, somewhat blunt.

Fig. 1, stamens:—*enlarged.*

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TAB. 8543.

RIBES LAURIFOLIUM.

West China.

SAXIFRAGACEAE. Tribe RIBESIEAE.

RIBES, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 654.

Ribes laurifolium, *Janczewski in Bull. Acad. Cracovie*, sér. B, 1910, p. 97, fig. 6; species *R. Henryi*, Franch., affinis, ramulis etiam junioribus glabris, foliis magis coriaceis distincte serrato-crenatis eciliatis subtus eglandulosis, petiolo multo longiore, racemis fructigeris baccas ad 7 gerentibus, rhachi pedicellis fructuque tenuiter tomentellis distinguenda.

Frutex sesquimetralis ramis crassiusculis inermibus etiam juvenilibus glabris, maturis cortice castaneo lucidulo tectis. *Gemmae* majusculae, ovoideae, 1 cm. longae; perulae scariosae, rotundato-ovatae, obtusae, minute apiculatae, praeter margines minutissime ciliolatos glabrae, brunneae. *Folia* breviter petiolata, secundum ramos disposita, lamina ovata vel ovato-oblonga, basi rotundata, apice acuta, praeter trientem vel quadrantem inferiorem serrato-crenata crenis glanduloso-apiculatis, 6–10 cm. longa, 3–5 cm. lata, coriacea, glaberrima, 3–5-plinervia nervis lateralibus superioribus paucis valde obliquis; petiolus crassus, 5–15 mm. longus, magis minusve setosus setis interdum glanduligeris. *Racemi maris* penduli, graciles, 2·5–4 cm. longi, ad 12-flori, pedunculo circiter 1 cm. longo suffulti, bracteati; pedicelli ad 7 mm. longi; bracteae submembranaceae, oblongae, acutae, virescentes, sparse glanduloso-ciliolatae, ad 12 mm. longae. *Flores* virescentes, 10–12 mm. diametro, praeter receptaculum subpatelliforme minute pubescens glabri. *Sepala* late oblonga vel subrotundata, obtusa, 4 mm. longa. *Petala* spathulata, 2 mm. longa. *Stamina* petala subaequantia; filamenta 1·5 mm. longa; antherae rotundatae. *Stylus* apice 2-fidus. *Racemi feminei* primo erecti, sub fructu penduli, graciles, circiter 2 cm. longi, ad 12-flori, pendunculo sub anthesi brevi suffulti, indumento maris induti; pedicelli sub anthesi 3 mm. longi, sub fructu ad 7 mm. longi; bracteae maris, deciduae. *Flores* virescentes, 6–8 mm. diametro, praeter receptaculum lageniforme vel ambitu oblongum, basi attenuatum, griseo-tomentellum glabri. *Sepala petalaque* eis maris conformia sed minora. *Stamina* ad corpuscula minuta rubra redacta. *Stylus* vix 2 mm. longus; stigmata 2, brevia, subglobosa. *Fructus* late ellipsoideus, calyce paulo accrescente coronatus, 15 mm. longus, 10 mm. diametro, tenuissime tomentellus, rubescens.—O. STAPF.

The *Ribes* here figured is one which has been raised from seed collected in 1908 at an altitude of about 5,000 ft. at Wa-Shen in Western Szechuan by Mr. E. H. Wilson, and presented by Professor Sargent of the Arnold Arboretum to the Royal Botanic Gardens of Kew and Glasnevin and to Mr. Vicary Gibbs; the material on which our illustration has been based has come in part from all three sources. At

MARCH, 1914.

Glasnevin some of the young plants were put out in the open, others were retained in pots, and in 1912 one of the latter, a female, flowered for the first time. In 1913 this plant flowered again; so did another female and, later on, a male in the open. Fertilisation was now possible, but from the female in the open the flowers dropped just as the ovary began to swell; on the pot plant fruit set readily. At Kew, where the only plants were in the open, the experience was as at Glasnevin, and it is probable that this *Ribes* will not bear regular crops of fruit in the average climate of the British Isles owing to the very early date, February, at which the flowers expand. It is, however, in this early flowering habit that one of the chief merits of this flowering currant will reside; later in the season their greenish colour and modest charms would make a less potent appeal. Fortunately the flowers of both sexes are able to withstand rough cold weather. This species, *R. laurifolium*, was first described from fruiting specimens and placed by Professor Janczewski in his section *Davidia* of the subgenus *Berisia*, apparently largely owing to the circumstance that Wilson's original specimens had but a few terminal leaves. Though it is now found that in this regard *R. laurifolium* does not resemble *R. Davidii*, Franch. and *R. Henryi*, Franch., the other members of the section *Davidia*, it is clearly a component of the same natural group. A slow grower in all three gardens which have contributed to our plate, the largest plants being only a foot and a half high, it is quite hardy, thriving well in a good loamy soil, and is readily propagated by cuttings. The colour of the fruit when ripe is not yet fully known. Sir F. Moore, to whom we are indebted for much information regarding the species, informs us that immediately after fertilisation the fruits of his greenhouse plant commenced to swell, the persistent calyx also increasing in size, so that in April it was fully half as long as the fruit. Thereafter the calyx ceased to enlarge and began to change colour. The fruits themselves continued to enlarge until the middle of June, remaining, however, green and unattractive, in shape like a long gooseberry, with the calyx now only one-fifth the length of the fruit. In July patches of dark purple appeared on the fruits, and as signs of shrivelling manifested themselves the specimen was cut and sent to us for incorporation in our plate. The female flowers, drawn earlier, were from a Kew specimen; the male from one kindly supplied from his collection at Aldenham by Mr. Vicary Gibbs.

Description.—*Shrub* 5–6 ft. high, with rather stout unarmed branches, glabrous even when young, when mature clothed with chestnut-brown somewhat shining bark. *Buds* rather large, ovoid, $\frac{1}{3}$ in. long, their scales scarious, rounded-ovate, obtuse, finely apiculate, brown and glabrous except along the finely ciliolate edges. *Leaves* short petioled, scattered, ovate or ovate-oblong, acute, base rounded, margin serrate-crenate with gland-tipped teeth except for the entire basal fourth to third, $2\frac{1}{4}$–4 in. long, $\frac{1}{4}$–2 in. wide, coriaceous, quite glabrous, 3–5-nerved at the base with a few very oblique nerves leaving the midrib above the base; petiole stout, $\frac{1}{5}$–$\frac{2}{3}$ in. long, more or less beset with setae which are at times glandular. *Male*: *Racemes* pendulous, slender, 1–$1\frac{3}{4}$ in. long, up to 12-flowered; peduncles bracteate, about $\frac{1}{3}$ in. long; pedicels about $\frac{1}{4}$ in. long; bracts somewhat membranous, oblong, acute, greenish, sparingly glandular-ciliate, up to $\frac{1}{2}$ in. long. *Flowers* greenish, $\frac{1}{3}$–$\frac{1}{2}$ in. across, glabrous except for the minutely pubescent, somewhat cup-shaped receptacle. *Sepals* wide-oblong or rather rounded, obtuse, $\frac{1}{6}$ in. long. *Petals* spathulate, $\frac{1}{12}$ in. long. *Stamens* about as long as the petals; filaments under 1 lin. long; anthers rounded. *Style* 2-fid. *Female*: *Racemes* at first erect but in fruit pendulous, slender, about $\frac{3}{4}$ in. long, up to 12-flowered, when in flower shortly peduncled; pedicels in flower $\frac{1}{8}$ in. long, in fruit $\frac{1}{4}$ in. long; bracts as in the male, deciduous. *Flowers* greenish, $\frac{1}{4}$–$\frac{1}{3}$ in. across; glabrous except for the finely grey-tomentose flask-shaped or oblong receptacle. *Sepals* and *petals* as in the male flowers but smaller. *Stamens* reduced to small red staminodes. *Style* under $\frac{1}{12}$ in. long; stigmata 2, short, subglobose. *Fruit* wide-elliptic, tipped by the slightly enlarged calyx, about $\frac{2}{3}$ in. long, over $\frac{1}{3}$ in. wide, minutely tomentose, reddish.

Fig. 1, male flower; 2, female flower; 3, fruit in transverse section; 4, seed:—*all enlarged.*

8544.

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Tab. 8544.

SALVIA uliginosa.

Eastern South America.

Labiatae. Tribe **Monardeae.**

Salvia, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1194.

Salvia uliginosa, *Benth., Labiat.* p. 251 *et in DC. Prodr.*, vol. xii. p. 305; *S. laevi*, Benth., affinis sed caulibus conspicue sulcatis, foliis pagina inferiore glandulosis, inflorescentiis compositis distinguitur.

Herba; caules usque ad 2·5 m. alti, ramosi, obtuse tetragoni, sulcati, glandulosi, adpresse pubescentes. *Folia* oblongo-lanceolata, apice acuta, basi longe cuneata, superne gradatim minora, usque ad 9 cm. longa et 2 cm. lata, profunde serrata, viridia, membranacea, supra glabra, infra nervis adpresse pubescentia glandulisque nigris crebris punctata, nervis lateralibus utrinque circiter 7 cum costa pagina superiore leviter impressis, inferiore prominentibus, suprema sessilia, intermedia infimaque petiolo usque ad 2 cm. longo suffulta. *Inflorescentia* terminalis, composita; racemi spiciformes, compacti, terminales usque ad 11 cm. longi, laterales usque ad 6 cm. longi, longe pedunculati. *Verticillastri* 7–20-flori; bracteae ovatae, longe acuminatae, cum acumine 2 mm. longo 6 mm. longae, ciliatae, mox deciduae. *Calyx* campanulatus, pubescens, glandulosus, lobis ovato-triangularibus posteriore leviter bi- vel tri-dentato, lateralibus apice acuminatis. *Corolla* coerulea; tubus 7 mm. longus, basi 1·5 mm. diametro, fauce 4 mm. diametro, labio antico trilobo 8 mm. longo 7 mm. lato, postico leviter bilobo 5·5 mm. longo 3·5 mm. lato. *Antherae* 2 mm. longae; filamenta 2 mm. longa, connectivis postice deflexis 4 mm. longis sub insertione callosis infra medium longitudinaliter connatis. *Ovarium* 1·5 mm. altum, 1 mm. diametro; stylus (cum ramis) 11 mm. longus, glaber, bilabiatus labio postico recurvato 3 mm. longo, antico recto 1·25 mm. longo.—W. B. Turrill.

The *Salvia* here represented is a native of South America which is represented in the herbarium at Kew by a number of specimens collected in Brazil and Uruguay and by a single example from Buenos Ayres. The plant from which the material for our illustration has been derived is one which was presented to Kew in 1912 by Mr. P. L. de Vilmorin, Verrières. The conspicuously sulcate quadrangular stem is a very marked feature of *S. uliginosa*. The toothing of the leaves is another, for although in other respects there is considerable variability, the type of serration always remains the same. The leaves vary a good deal as regards the presence or absence of pubescence, but the glands on the lower surface remain a constant and distinguishing feature. At Kew *S. uliginosa* has proved hardy, and during the summer of 1913 formed a somewhat loose plant about 6 feet high with erect shoots and with inflorescences which are nearly always compound, many-flowered and compact, in full blossom from the opening of September to the middle of November. Judging from the experience at Kew, *S. uliginosa* is likely to be a serviceable plant for the herbaceous border.

DESCRIPTION.—*Herb*; stems up to 8 ft. high, branched, bluntly 4-angled, sulcate, glandular, adpressed-pubescent. *Leaves* oblong-lanceolate, acute, base long-cuneate, gradually diminishing in size upwards, up to 3½ in. long, ¾ in. wide, deep-serrate, green, membranous, glabrous above, adpressed pubescent on the nerves and dotted with numerous black glands beneath; lateral nerves about 7 on each side of the midrib, and like the latter slightly impressed above, raised beneath, the uppermost leaves sessile, those below with petioles up to ¾ in. long. *Inflorescence* terminal, compound; racemes spiciform, compact, the terminal up to 4⅓ in. long, lateral 2¼ in. long, long-peduncled. *Verticillasters* 7–20-flowered; bracts ovate, long-acuminate, ciliate, soon deciduous, ¼ in. long including the tip. *Calyx* campanulate, pubescent, glandular; lobes ovate-triangular, the posterior slightly 2–3-toothed, lateral with acuminate tips. *Corolla* blue, tube under ⅓ in. long, very narrow at the base, anterior lip 3-lobed, ⅓ in. long, nearly as wide, posterior lip 2-lobed, about ¼ in. long, ⅐ in. wide. *Anthers* 1 lin. long, filaments as long with the connective bent backwards, 2 lin. long. *Ovary* under 1 lin. long; style, including the style-arms, nearly ½ in. long, glabrous, 2-lobed, the upper lobe recurved, ⅛ in. long, twice as long as the straight anterior lobe.

Fig. 1, section of stem; 2, portion of undersurface of leaf; 3, calyx, laid open and showing pistil; 4, corolla-tube, laid open; 5, anther; 6, upper portion of style, with stigma:—*all enlarged.*

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TAB. 8545.

KNIPHOFIA CARINATA.

South Africa.

LILIACEAE. Tribe HEMEROCALLEAE.

KNIPHOFIA, *Moench*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 775; *A. Berger in Engl. Pflanzenreich, Lil.-Asphod.-Aloin.* p. 31.

Kniphofia carinata, *C. H. Wright*; species *K. comosae*, Hochst., affinis, filamentis luteis, perianthio vix duplo longioribus differt.

Herba perennis. *Folia* 7·5 dm. longa, e basi 2·5 cm. lata ad apicem acuminatum gradatim attenuata, supra profunde canaliculata, subtus acute carinata, tenuia, glabra, marginibus levibus anguste albo-cartilagineis instructa. *Scapus* cylindricus; bracteae lanceolatae, longe acuminatae, scariosae, 8 mm. longae, 2 mm. latae; racemus 15 cm. longus, densiflorus; pedicelli breves; flores nutantes. *Perianthium* claro-luteum; tubus anguste urceolatus, supra ovarium leviter constrictus, 18 mm. longus, prope apicem 5 mm. diametro; lobi erecto-patentes, obtusi, 3 mm. longi, 3·5 mm. lati. *Filamenta* circiter 30 mm. longa, perianthio concolora; antherae oblongae, 3 mm. longae. *Ovarium* ovoideum, 4 mm. longum, trilobum, leve; stylus subulatus, staminibus paullo longior. *Ovula* plura.—C. H. WRIGHT.

The *Kniphofia* which we depict is a South African species for the introduction of which horticulture is indebted to Miss Ayliff of Rose Cottage, Grahamstown, South Africa, by whom seeds were presented to Kew in 1892. The plants raised from these seeds have been grown in pots in a cool frame, where, however, they throve indifferently until 1912, when they suddenly began to make vigorous growth and flowered for the first time in September of that year. They flowered again in September, 1913, when the opportunity was taken of preparing the present illustration. During the twenty years that this species has been in cultivation without flowering at Kew it has also been tried in the open border with other species of *Kniphofia*, but has never in that situation proved a success owing to its being manifestly less hardy than the majority of the species under cultivation. The species when in flower was seen by Mr. Berger, who at once recognised it as one not enumerated in his recent scholarly monograph of the genus. It is apparently most closely allied to the Abyssinian *K. comosa*,

Hochst., figured at t. 6569 of this work, which has also a clear-yellow perianth similar in shape to that of *K. carinata*, but is readily distinguished by its much longer bright red filaments. Both species have leaves of thin texture which are acutely keeled upwards from a short distance above the base. The Transvaal species *K. ensifolia*, Baker, is easily recognised by its scabrous leaf-margins, while the Abyssinian species *K. Leichtlini*, Baker, figured at t. 6716 of this magazine, which is a member of the same section, differs in having a reddish perianth, stamens that are but slightly exserted, and a less pronounced more obtuse keel to the leaf.

DESCRIPTION.—*Herb*, perennial. *Leaves* $2\frac{1}{2}$ ft. long, 1 in. wide at the base, thence gradually tapering to an acuminate tip, deeply channelled above, sharply keeled beneath, thin, glabrous, margins smooth, narrowly hyaline. *Scape* cylindric; bracts lanceolate, long-acuminate, scarious, $\frac{1}{3}$ in. long, $\frac{1}{12}$ in. wide; raceme 6 in. long, dense-flowered; pedicels short; flowers nodding. *Perianth* clear-yellow; tube narrow-urceolate, slightly constricted above the ovary, $\frac{3}{4}$ in. long, $\frac{1}{5}$ in. across near the tip; lobes erecto-patent, obtuse, $\frac{1}{8}$ in. long, $\frac{1}{7}$ in. wide. *Filaments* about $1\frac{1}{4}$ in. long, coloured like the perianth; anthers oblong, $\frac{1}{8}$ in. long. *Ovary* ovoid, $\frac{1}{6}$ in. long, 3-lobed, smooth; style subulate, rather longer than the stamens. *Ovules* numerous.

Fig. 1, a flower; 2 and 3, stamens; 4, pistil:—*all enlarged.*

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TAB. 8546.

COTONEASTER TURBINATA.

China.

ROSACEAE. Tribe POMEAE.

COTONEASTER, *Medik. ex Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p 627.

Cotoneaster turbinata, *Craib*; a *C. pannosa,* Franch., eiusque affinioribus fructu turbinato facile distinguenda; a *C. coriacea,* Franch., foliis apice plerumque acutis nec emarginatis, fructu minore turbinato recedit.

Frutex 2-metralis. *Ramuli* juventute sericei, mox tomentosi, demum glabri vel hic illic puberuli, cortice brunneo vel fusco-brunneo subnitido striato vel reticulato-striato obtecti. *Folia* oblanceolata ad ovato-lanceolata, apice acuta, obtusa vel rarius rotundata, mucronulata, basi parum inaequilateralia, cuneata, 1·5–4·5 cm. longa, 0·7–2 cm. lata, papyracea vel tenuiter coriacea, pagina superiore nisi costa pilis paucis albis instructa glabra, inferiore molliter sericeo-arachnoidea, costa supra immersa subtus prominente, nervis lateralibus utrinque circiter 8 supra leviter impressis vel conspicuis subtus prominulis, nervulis cum reticulatione gracili supra conspicuis vel fere subprominulis, petiolo ad 7 mm. longo supra canaliculato indumento ramulorum suffulto; stipulae lineares, acutae, ad 5 mm. longae, diutius persistentes. *Inflorescentia* compacta, multiflora, corymbiformis vel pyramidato-corymbiformis; pedunculi partiales ad 1 cm. longi; pedicelli ad 3 mm. longi, indumento ut pedunculi ramulique; bracteae angustae, acutae, ad 2·75 mm. longae, dorso pilosae. *Receptaculum* 1·5 mm. altum. *Sepala* deltoidea, acuta, 1·5 mm. longa et lata, indumento extra ut pedicelli. *Petala* subrotundata, 2 mm. (ungui incluso) longa, 1·75 mm. lata. *Filamenta* 2 mm. longa, glabra, antheris parvis. *Carpella* 2 parva, pilosa, ovulis binis erectis, stylis 2 circiter 2 mm. longis. *Fructus* turbinatus, circiter 4 mm. altus, tenuiter arachnoideus.—W. G. CRAIB.

The *Cotoneaster* which forms the subject of our illustration was received at Kew from the collection of Mr. M. L. de Vilmorin at Les Barres in 1910 under the two numbers 4484 and 4547. The seed from which the first of these was raised was received, Mr. de Vilmorin informs us, in June, 1897, from the Abbé Farges, who had collected them during the previous year to the north of Ichang in Eastern Szechuan. The original plant in Mr. de Vilmorin's garden fruited in 1903. The seed from which the second was raised was received in November, 1905, from Mr. C. Sprenger of Naples, who informed Mr. de Vilmorin that it had come from Hupeh. This latter, Mr. de Vilmorin states, suffered from frost during the winter of 1908–9, but soon recovered. The species has grown very well at Kew since its introduction, and by 1913 the tallest plant had reached six feet in height. It is evidently very hardy and vigorous and

thrives in any soil of moderate quality. From the other species of *Cotoneaster* in cultivation *C. turbinata* is very readily distinguished by its flowering so late as in July, when the flowering season of trees and shrubs in general is decidedly on the wane. This habit of flowering six to eight weeks later than any other *Cotoneaster* imparts to our plant a special horticultural value, and assures it a warm welcome owing to the addition it makes at this particular season to the attractions of the garden. Its nearest botanical affinity appears to be with *C. coriacea*, Franch., a species known at Kew from fruiting material only. In *C. coriacea* the leaves are usually obovate and are uniformly rounded at the tip and then generally emarginate and apiculate; in *C. turbinata* the leaves are usually lanceolate with the apex acute. The fruit of *C. turbinata* matures in October. The species is readily increased by cuttings of the shoots of the current season made in August.

DESCRIPTION.—*Shrub*, up to 6 ft. high; twigs silky when young, soon tomentose, then glabrous or casually puberulous; bark brown or tawny, rather polished, striate or reticulate. *Leaves* oblanceolate or ovate-lanceolate, acute obtuse or rarely rounded, mucronulate, slightly unequal and cuneate at the base, $\frac{2}{3}$–$1\frac{3}{4}$ in. long, $\frac{1}{3}$–$\frac{3}{4}$ in. wide, chartaceous or thinly coriaceous, glabrous above except for a few white hairs along the midrib, softly silky-arachnoid beneath, midrib impressed above, raised beneath, lateral nerves about 8 along each side, slightly impressed above, raised beneath, fine reticulation rather distinct above; petiole nearly $\frac{1}{3}$ in. long, channelled above, silky; stipules linear, acute, up to $\frac{1}{5}$ in. long, rather long persistent. *Inflorescence* compact, many-flowered, corymbose or somewhat pyramidal; partial peduncles $\frac{1}{3}$ in. long and pedicels $\frac{1}{8}$ in. long, silky; bracts narrow, acute, about $\frac{1}{9}$ in. long, pilose on the back. *Receptacle* under 1 lin. high. *Sepals* deltoid, acute, small, silky outside. *Petals* nearly round, 1 lin. long, nearly as wide. *Filaments* 1 lin. long, glabrous; anthers small. *Carpels* 2, small, pilose; ovules in pairs, erect; styles 2, about 1 lin. long. *Fruit* turbinate, about 2 lin. high; thinly silky.

Fig. 1, petiole and stipules; 2, bud; 3, longitudinal section of a flower, the petals removed; 4 and 5, anthers; 6, fruit:—*all enlarged.*

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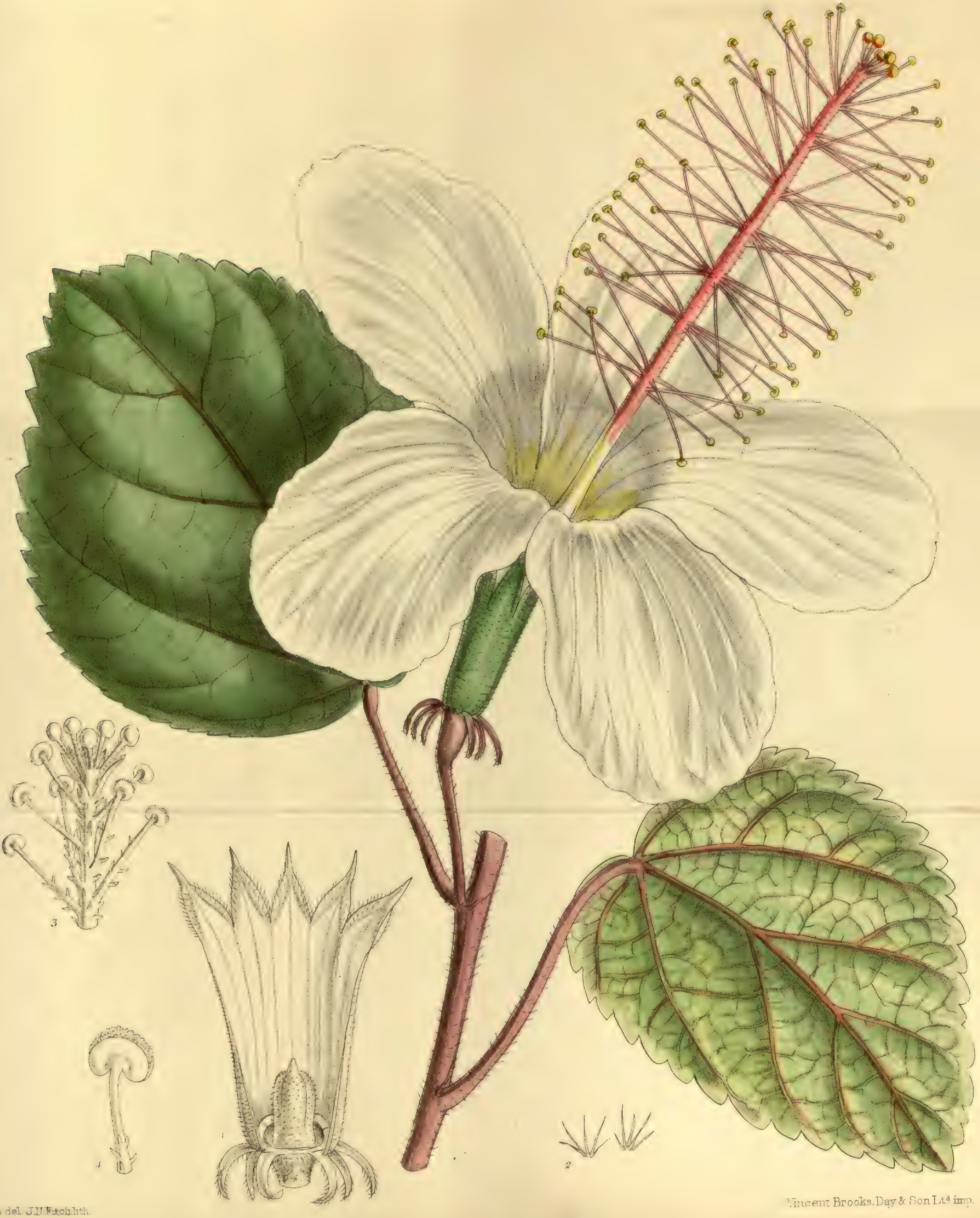

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TAB. 8547.

HIBISCUS WAIMEAE.

Hawaiian Islands.

MALVACEAE. Tribe HIBISCEAE.

HIBISCUS, *Linn.; Benth. et Hook. f. Gen. Plant.* vol. i. p. 207; *Hochreutiner in Ann. Conserv. et Jard. Bot. Genève*, vol. iv. p. 23.

Hibiscus Waimeae, *A. A. Heller in Minnes. Bot. Studies*, vol. i. p. 851; *Hochreutiner in Ann. Conserv. et Jard. Bot. Genève*, vol. iv. p. 132; affinis *H. Kokio*, Hillebr., a quo bracteis parvis reflexis, corolla alba, tubo staminali longissimo distinguitur.

Arbor parva, usque ad 7·5 m. alta. *Ramuli* annotini circiter 4 mm. diametro, cortice saepius cinereo, cicatricibus foliorum delapsorum prominentibus, hornotini ut petioli pedicellique sordide purpurei, patule pilosi. *Folia* late elliptico-ovata vel suborbicularia, basi rotundata vel plus minusve cordata, apice obtusa vel subapiculata, 9–20 cm. longa, 7–17 cm. lata, crenata vel crenato-serrata, supra glabriuscula, subtus puberula, nervis purpureis subtus prominentibus; petioli 4–10·5 cm. longi; stipulae subulatae, caducae. *Flores* in axillis superioribus solitarii; pedicelli 3–5 cm. longi, superne in basin calycis incrassati. *Bracteae involucri* 6–8, reflexae, lineari-subulatae, circiter 1 cm. longae. *Calyx* tubulosus, sursum leviter ampliatus, ultra medium unilateraliter fissus, in toto 3–3·7 cm. longus, extra breviter pubescens; lobi triangulares, acuminati, circiter 1 cm. longi. *Corolla* alba, limbo patulo; segmenta 11–12 cm. longa. *Tubus* staminalis usque ad 16 cm. longus, superne ut filamentella papillatus, ruber; filamentella irregulariter verticillatim disposita, 2–2·5 cm. longa. *Ovarium* oblongum, breviter pubescens. *Styli* rami 5, leviter divergentes, stigmatibus capitatis.—*H. Arnottianus*, H. Mann in Proc. Amer. Acad. vol. vii. p. 157; Sinclair, Fl. Hawaiian Isl. t. 8.—T. A. SPRAGUE.

The beautiful *Hibiscus* which forms the subject of our illustration is a native of the Hawaiian Archipelago, where it has been collected on the islands of Kauai, Oahu and Hawaii. It belongs to a small group of species which includes *H. Rosa-sinensis*, Linn. and its allies, for which Hochreutiner has proposed the sectional name *Lilibiscus*. All of these are shrubs or trees with large and showy flowers, and are natives of Africa, the Mascarene Islands and Polynesia. The plant from which the material for our figure has been obtained was purchased as *H. Arnottianus* for the Kew collection from a Californian nursery company in 1911. In a sunny

position in the Mexican section of the Temperate House it has grown into a strong bush 8 ft. in height, and flowered for the first time in September 1913. As regards soil and temperature its requirements appear to be those of the familiar *H. Rosa-sinensis*, the Juva or "Shoe-flower" of Indian gardens. The name *H. Arnottianus*, under which our plant was received from California, is that by which the species is usually known in collections. But that name unfortunately has from time to time been applied to three distinct plants, and when an effort is made to restrict its incidence to one of the three we find that it is not to the present species, but to a nearly allied one with red flowers that it must be limited. The most satisfactory solution of the difficulty, as Mr. Sprague has elsewhere pointed out, would be to abandon altogether the employment of the name *H. Arnottianus*.

DESCRIPTION.—*Tree* up to 25 ft. high; twigs of the preceding season about $\frac{1}{6}$ in. thick, bark usually grey, marked with very pronounced leaf-scars; young twigs dull purple and hairy, as are the petioles and pedicels. *Leaves* wide elliptic-ovate or suborbicular, obtuse or apiculate, base rounded or somewhat cordate, margin crenate or crenate-serrate, $3\frac{1}{2}$–8 in. long, 3–7 in. wide, almost glabrous above, puberulous beneath, veins purplish, raised beneath; petiole $1\frac{1}{2}$–4 in. long; stipules subulate, caducous. *Flowers* solitary in the upper axils; pedicels $1\frac{1}{4}$–2 in. long, slightly thickened upwards just under the calyx; involucral bracts 6–8, reflexed, linear-subulate, about $\frac{1}{3}$ in. long. *Calyx* tubular, slightly enlarged upwards, split on one side above the middle, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, shortly pubescent externally; lobes triangular, acuminate, about $\frac{1}{3}$ in. long. *Corolla* white; limb spreading; segments about $4\frac{1}{2}$ in. long. *Staminal tube* over 6 in. long, papillate and towards the upper part red like the free filaments, which are irregularly whorled and are $\frac{3}{4}$–1 in. in length. *Ovary* oblong, shortly pubescent. *Style-arms* 5, slightly diverging; stigmas capitate.

Fig. 1, calyx split open, showing ovary; 2, stellate hairs on pedicel; 3, apex of staminal tube, with style-arms; 4, anther:—*all enlarged.*

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TAB. 8548.

GLADIOLUS MASONIORUM.

Tembuland.

IRIDACEAE. Tribe IXIEAE.

GLADIOLUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 709.

Gladiolus Masoniorum, *C. H. Wright in Kew Bulletin,* 1913, p. 305; species *G. sulphureo,* de Graaf, affinis, lobis perianthii brevioribus spathisque acuminatis differt.

Herba. *Folia* 5·3 dm. longa, 1 cm. lata, basi apiceque attenuata, utrinque hirsuta, costa crassa, nervis marginalibus validis instructa. *Racemus* 30 cm. longus, laxus, glaber; spathae virides, herbaceae, glabrae; exterior lanceolata, acuminata, 3·5 cm. longa, 1·2 cm. lata, interior minor, 3 cm. longa. *Perianthium* cremeum, ad faucem pallide luteum, intra tubum viride; tubus 2 cm. longus, anguste infundibuliformis, curvatus; lobi 5 superiores subaequales, 3 cm. longi, 2 cm. lati, obtusi, undulati; lobus inferior 1·5 cm. latus. *Antherae* cremeae. *Stigmatis lobi* spatulati, 3 mm. longi, laciniati.—C. H. WRIGHT.

The *Gladiolus* now figured was discovered in Tembuland in December 1910 by Canon G. E. Mason of Umtata, and his sister Miss M. H. Mason, in compliment to both of whom it has been named. A year and a half later material was sent to the Cambridge Botanic Garden, where under the care of Mr. Lynch the plant came into flower not quite twelve months after the receipt of the corms, in the end of May 1913. From material sent by Mr. Lynch the present plate has been prepared. The perianth is of a soft creamy tint with green inside the lower part of the tube; the anthers are of much the same colour as the perianth. The section to which *G. Masoniorum* belongs is one whose species are difficult to discriminate. Its leading member is the widely spread *G. Quartinianus,* A. Rich., which includes many forms with variously coloured flowers, all of them with somewhat hooded upper perianth-segments. The nearest ally within this section to *G. Masoniorum* is *G. sulphureus,* de Graaf, figured at t. 7791, which, however, is different from *G. sulphureus,* Jacq., now *Babiana stricta,* var.

sulphurea, Bak., and from *G. sulphureus*, Bak., for which Mr. Wright now proposes the name *G. deiodes*. When first received at Cambridge in June 1912, the corms, Mr. Lynch informs us, were potted in good sandy loam with some leaf mould, and kept in a frame until they began to grow in early September. They were then transferred to the Intermediate House and kept until early April, when they went to the Succulent House, where they flowered in May. In spring 1913 a growing corm was planted out-of-doors on the west border of the Palm House, near the wall. This flowered in July last. The plant after having withstood eleven degrees of frost, its leaves remaining quite green, survived the winter of 1913–14; the position it occupies is, however, a very sheltered one. Treatment in a pot, comparatively dry, is likely to keep the corms dormant until early spring; for although growth took place the first year early in September, in the second year the corms have remained dormant until spring. The retention of green leaves in the open indicates a tendency to prolong the natural time of growth.

DESCRIPTION.—*Herb.* *Leaves* 1½–1¾ ft. long, over ⅓ in. wide, narrowed towards tip and base, hirsute on both surfaces; midrib stout, marginal nerves strong. *Raceme* 1 ft. long, lax, glabrous; spathes green, herbaceous, glabrous, the outer one lanceolate, acuminate, about 1½ in. long, ½ in. broad; the inner smaller, 1¼ in. long. *Perianth* cream-coloured, with a pale yellow throat and a greenish base within; tube ¾ in. long, narrowly funnel-shaped, curved; five upper lobes subequal, 1¼ in. long, ¾ in. wide, obtuse, undulate; lower lobe under ⅔ in. wide. *Anthers* creamy yellow. *Stigmatic lobes* spathulate, ⅛ in. long, laciniate.

Figs. 1 and 2, anthers; 3, stigmatic lobes:—*all enlarged.*

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TAB. 8549.

BERBERIS PRATTII.

Western China.

BERBERIDACEAE. Tribe BERBERIDEAE.

BERBERIS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 43.

Berberis Prattii, *C. K. Schneider in Sargent, Plantae Wilsonianae*, vol. i. p. 376; affinis *B. polyanthae*, Hemsl., et *B. brevipaniculatae*, C. K. Schneider; ab illa rete venularum foliorum laxiore, paniculis angustioribus, ab hac foliis magis serratis subtus non glaucis differt.

Frutex 2–3 m. altus. *Ramuli* juniores minutissime pilosi, fusci, sulcati, internodiis 1·5–2·5 cm. longis; vetustiores cinerascentes. *Spinae* indivisae vel saepius tripartitae, graciles, 1–1·5 cm. longae, subtus sulcatae. *Folia* circiter quaterna vel quina fasciculata (ad 10 fasciculata, *fide Schneider*), obovato-oblonga vel obovata, apice rotundata vel retusa, mucronulata, in petiolum brevem vel brevissimum sensim angustata, 1–3·5 cm. longa, 0·5–1·5 cm. lata, integra vel, praesertim in partibus inferioribus ramulorum, ultra medium spinuloso-serrata; supra viridia, subtus pallidiora, utrinque exsiccando valde reticulata. *Paniculae* angustae, circiter 4–5 cm. longae, glabrae; bracteae ovatae, caudato-acuminatae, circiter 3 mm. longae; pedicelli 3–5 mm. longi, apice bibracteolati, bracteolis triangularibus obtusis rubris vix 2 mm. longis. *Flores* circiter 5 mm. diametro. *Sepala* 6, late elliptico-obovata, valde concava, trinervia nervis lateralibus demum furcatis, 3 exteriora circiter 3 mm. longa, 3 interiora circiter 4 mm. longa. *Petala* 6, sepalis opposita, obovata, 3–3·5 mm. longa, 2 mm. lata, emarginata, trinervia, glandulis duabis oblongis 1·3 mm. longis nervis lateralibus 0·7 mm. supra basin insidentibus. *Stamina* 6, petalis opposita, 2 mm. longa. *Ovarium* leviter stipitatum, ovoideum, stylo brevi; ovula 2, erecta. *Baccae* ellipsoideae, salmoneo-rubrae, 6–7 mm. longae, stylo 0·6 mm. longo. *Semina* 1–2, oblongo-obovoidea, 3·7 mm. longa, rubella.—*B. polyantha*, Hemsl. in Journ. Linn. Soc. Bot. vol. xxix. p. 302, partim.—T. A. SPRAGUE.

This Western Szechuan shrub was first collected by Mr. A. E. Pratt in the neighbourhood of Tachien-lu. It was subsequently met with there and at Mupine by Mr. E. H. Wilson, when collecting for Messrs. J. Veitch and Sons. Originally included by Hemsley in *B. polyantha*, this *Berberis* has been kept apart by Schneider on account of its less closely reticulated leaves and narrower inflorescences. But while perhaps most closely related to *B. polyantha*, Hemsl., *B. Prattii* most resembles *B. brevipaniculata*, C. K. Schneid., with which it has been confused in collections, though it is readily distinguished by the pale green but not glaucous lower surface of the leaves. Like *B. brevipaniculata* our plant is a shrub of dense growth, forming

a mass of twiggy branches out of which are thrust each year a number of long whip-like shoots. More beautiful when in flower than most Chinese species of the genus, it is still more effective when laden in September with its branches of salmon-red fruits. The material for our figure was gathered from a plant in the Arboretum Nursery at Kew, which had been purchased from Messrs. Veitch in 1909. The shrub grows very freely and is apparently quite hardy; the freedom with which it fruits promises to make its propagation easy. Like other species of *Berberis* this one enjoys a well-drained loamy soil.

DESCRIPTION.—*Shrub*, 6–10 ft. high; young twigs finely pilose, tawny, grooved; internodes $\frac{2}{3}$–1 in. long; old twigs ash-grey. *Spines* undivided or more often 3-partite, slender, $\frac{1}{3}$–$\frac{2}{3}$ in. long, grooved underneath. *Leaves* in fascicles of 4–5 (according to Schneider a fascicle may include as many as 10) obovate-oblong or obovate, rounded or blunt and mucronulate at the tip, narrowed gradually below into a short or very short petiole, $\frac{1}{3}$–$1\frac{1}{3}$ in. long, $\frac{1}{5}$–$\frac{2}{3}$ in. wide, entire or more particularly on the lower part of the twigs spinulose serrate beyond the middle, green above, paler beneath, in drying very markedly reticulate on both surfaces. *Panicles* narrow, $1\frac{3}{4}$–2 in. long, glabrous; bracts ovate, caudate-acuminate, about $\frac{1}{8}$ in. long; pedicels $\frac{1}{8}$–$\frac{1}{5}$ in. long, bibracteolate at the tip, bracteoles triangular, obtuse, red, under $\frac{1}{12}$ in. long. *Flowers* about $\frac{1}{5}$ in. across. *Sepals* 6, wide elliptic-obovate, very concave, 3-nerved, lateral nerves at length divided; three outer about $\frac{1}{8}$ in. long, three inner about $\frac{1}{6}$ in. long. *Petals* 6, opposite the sepals, obovate, $\frac{1}{8}$–$\frac{1}{7}$ in. long, $\frac{1}{2}$ in. wide, emarginate, 3-nerved with two rather large oblong glands on the lateral nerves a little above the base. *Stamens* 6, opposite the petals, $\frac{1}{12}$ in. long. *Ovary* shortly stipitate, ovoid; style short; ovules 2, erect. *Berry* ellipsoid, salmon-red, $\frac{1}{4}$ in. long, crowned by the short persistent style. *Seeds* 1–2, oblong-obovoid, about $\frac{1}{7}$ in. long, reddish.

Fig. 1, flower-bud; 2, flower; 3, petal; 4, stamen; 5, pistil:—*all enlarged.*

8550

M.S. del, J.N. Fitch lith.

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Tab. 8550.

OLEARIA semidentata.

Chatham Islands.

Compositae. Tribe Asteroideae.

Olearia, *Moench.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 276.

Olearia semidentata, *Dcne ex Hook. f. Fl. Nov. Zel.* vol. i. 115; *Hook. f. Handb. New Zeal. Fl.* p. 124; *Buch. in Trans. New Zeal. Inst.* vol. vii. p. 336, t. xiv.; *Kirk, Students' Fl.* p. 264; *Cheeseman, Man. New Zeal. Flora*, p. 280; *Dorrien Smith in Kew Bull.* 1910, pp. 120–126, cum icon.; affinis *O. chathamicae*, T. Kirk, foliis lineari-oblanceolatis latioribus differt.

Frutex parvus, parce ramosus, usque ad 1 m. altus; rami graciles, errabundi, pilis albidis appresse lanati. *Folia* numerosa, conferta, subpatula, lineari-oblanceolata, acuta, basi gradatim angustata, 4–7 cm. longa, 0·5–1 cm. lata, superne serrulata, inferne integra vel subintegra, juniora supra glabra vel leviter lanata, subtus floccoso-lanata, nervis ascendentibus. *Capitula* pedunculata, terminalia, solitaria vel ramorum apices versus pauca, 5–6 cm. diametro; pedunculus bracteis foliaceis parvis instructus, 3–5 cm. longus. *Involucri bracteae* numerosae, lineares, subacutae, 1–1·2 cm. longae, dense lanato-tomentosae, apice glabrescentes. *Flores radii* usque ad 50, purpurei. *Corollae* tubus cylindricus, 4 mm. longus, minute puberulus; limbus lineari-oblanceolatus, apice tridentatus, ad 2 cm. longus, superne minute puberulus. *Flores disci* fusco-purpurei. *Corollae* tubus inferne cylindricus, puberulus, superne subcampanulatus, glaber, 4·5 mm. longus; lobi lanceolati, subacuti, 1·5 mm. longi. *Antherae* 2·5 mm. longae. *Stylus* glaber; rami subacuti. *Achaenia* linearia, 0·5 cm. longa, sulcata, minute glanduloso-pubescentia. *Pappus* setosus, 6 mm. longus, barbellatus.—*Eurybia semidentata*, F. Muell. Veg. Chath. Is. p. 21.—J. Hutchinson.

The material for the figure now given of *Olearia semidentata*, Dcne, was supplied for the purpose from the gardens of Mr. T. A. Dorrien Smith at Tresco Abbey, Isles of Scilly, where a plant flowered in July 1913. The specimens were sent at the request of Captain A. A. Dorrien Smith, by whom it had been brought from the Chatham Islands to those of Scilly. The most nearly allied species is *O. chathamica*, T. Kirk, already figured at t. 8420 of this work. The two species grow in association in boggy places in the Chatham Islands. Captain Dorrien Smith records the existence in its native habitat of two colour varieties of the present species, one with

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pure white, the other with beautiful pink flowers. Dr. L. Cockayne, in an account of the plants of the Chatham Islands, has observed considerable variation in the size, the marginal indentation, and the degree of indumentum on the under surfaces of the leaves. The latter observer noted particularly three plants growing side by side, which so far as their general appearance was concerned might well pass for three distinct species. It is not impossible that, as they grow intermixed, hybridization may take place between this species and *O. chathamica*. The two species, besides being botanically very closely related, bear a considerable general resemblance to each other, and require the same cultural treatment. A specimen at Kew, presented by Captain Dorrien Smith some years ago, has not yet flowered.

Description.—*Shrub* up to 3–4 ft. high, sparingly branched; branches slender, straggling, adpressed woolly. *Leaves* many, close set, somewhat spreading, linear-oblanceolate, acute, gradually narrowed to the base, $1\frac{1}{2}$–$2\frac{3}{4}$ in. long, $\frac{1}{5}$–$\frac{2}{5}$ in. wide, serrulate upwards, entire or nearly so towards the base, when young glabrous or sparingly woolly above, floccosely woolly beneath; nerves ascending. *Heads* peduncled, terminal, solitary, or very few towards the tips of the branches, 2–$2\frac{1}{4}$ in. across; peduncle beset with small leafy bracts, $1\frac{1}{4}$–2 in. long. *Involucral bracts* many, linear, rather acute, $\frac{1}{3}$–$\frac{1}{2}$ in. long, densely woolly tomentose, glabrescent at the apex. *Ray-florets* up to 50 in number, purple. *Corolla* with finely puberulous, cylindric tube, $\frac{1}{6}$ in. long; limb linear-lanceolate, 3-toothed at the apex, finely puberulous upwards, $\frac{3}{4}$ in. long. *Disk-florets* purple. *Corolla* with tube puberulous and cylindric below, somewhat campanulate and glabrous upwards, $\frac{1}{6}$–$\frac{1}{5}$ in. long; lobes lanceolate, rather acute, very short. *Anthers* $\frac{1}{10}$ in. long. *Style* glabrous, its arms subacute. *Achenes* linear, very short, sulcate, finely glandular-pubescent. *Pappus* setose, $\frac{1}{4}$ in. long, barbellate.

Fig. 1, leaf-edge, showing leaf-teeth; 2, floret of the ray; 3, floret of the disk; 4, a pappus-hair; 5, anthers; 6, style-arms :—*all enlarged.*

M.S. del. J.N. Fitch lith.

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Tab. 8551.

EPIDENDRUM PROFUSUM.

Mexico.

Orchidaceae. Tribe Epidendreae.

Epidendrum, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 528.

Epidendrum (§ Encyclium) **profusum,** *Rolfe;* species ab *E. ambiguo,* Lindl., panicula densiore, floribus minoribus, sepalis et petalis latioribus, et labelli lobis minute crenulatis nec crispulo-undulatis differt.

Herba epiphytica. *Pseudobulbi* ovoidei, apice subattenuati, sulcati, 3–7 cm. longi, 2·5–4 cm. lati, 2–3-phylli. *Folia* ligulata, subobtusa, coriacea, 18–35 cm. longa, 1·5–2·5 cm. lata. *Scapi* terminales, 4·5–5·5 cm. longi; panicula subcompacta, multiflora, rami subflexuosi, 10–15 cm. longi. *Bracteae* ovatae, subobtusae, 2 mm. longae. *Pedicelli* graciles, circiter 2 cm. longi. *Flores* mediocres, speciosi, circiter 4·5 cm. diametro. *Sepala* et *petala* patentia, pallide flavo-viridia, sepala oblongo-lanceolata, subobtusa, 2·3 cm. longa; petala spathulato-lanceolata, subobtusa, 2·3 cm. longa. *Labellum* trilobum, 1·8 cm. longum, album, prope apicem purpureo-lineatum; lobi laterales oblongi, obtusi, basi columnam involventes, apice subrecurvi, minute crenulati; lobus intermedius ellipticus vel suborbicularis, obtusus, minute crenulatus, circiter 1 cm. latus; venis radiatis minus elevatis et verruculosis. *Columna* oblonga, 8 mm. longa.—*Epidendrum ambiguum*, Rolfe in Orch. Rev. 1913, p. 215, nec Lindl.—R. A. Rolfe.

The attractive *Epidendrum* here figured was obtained for the Kew Collection in 1911 by purchase from Messrs. Sander and Sons, St. Albans. In the house devoted to tropical orchids it has thriven well under the conditions suitable for other species of the same genus, and in June 1913 it flowered for the first time. It had been received under the name *E. Candollei*, Lindl., a species figured at t. 3765 of this work under the name *E. cepiforme*, Hook., but on flowering it showed itself to be very distinct from that plant and to be more closely allied to *E. aromaticum*, Batem., and more especially to *E. ambiguum*, Lindl. At first, indeed, it occurred to Mr. Rolfe that it might actually be a form of the last-mentioned species, which is somewhat imperfectly known. Further study, however, showed that our plant differs from *E. ambiguum* in having a denser panicle, with shorter and broader sepals and petals, and in being without a strongly crispate margin to the lip. The flowers are very fragrant. The purple veining on the lip is of a more decidedly magenta tint than it has been possible for the lithographer to reproduce. The locality Mexico is somewhat inferential, and is suggested owing to the circumstance that *E. Candollei*, Lindl., the plant for which this was mistaken when it was first introduced, is a Mexican species.

DESCRIPTION.—*Herb*, epiphytic; pseudobulbs ovoid, somewhat narrowed upwards, channelled, 1¼–3 in. long, 1–1½ in. wide, 2–3-phyllous. *Leaves* ligulate, rather blunt, coriaceous, 7–14 in. long, ⅔–1 in. wide. *Scapes* terminal, 1½–1¾ ft. long; panicle rather compact, many-flowered, with rather flexuous branches 4–6 in. long; bracts ovate, rather blunt, 1/12 in. long; pedicels slender, about ¾ in. long. *Flowers* medium-sized but showy, about 1¾ in. across. *Sepals* and *petals* spreading, pale yellowish-green; sepals oblong-lanceolate, rather blunt, nearly 1 in. long; petals spathulate-lanceolate, rather blunt, nearly 1 in. long. *Lip* 3-lobed, ¾ in. long, white, streaked with purple near the tip; lateral lobes oblong, blunt, enclosing the base of the column, recurved at the tip, finely crenulate; mid-lobe elliptic or suborbicular, blunt, finely crenulate, about ⅓ in. wide, nerves radiating, slightly raised and finely verrucose. *Columns* oblong, ⅓ in. long.

Fig. 1, a portion of the lip; 2, column; 3, pollen-masses; 4, sketch of an entire plant:—*all enlarged except* 4, *which is much reduced.*

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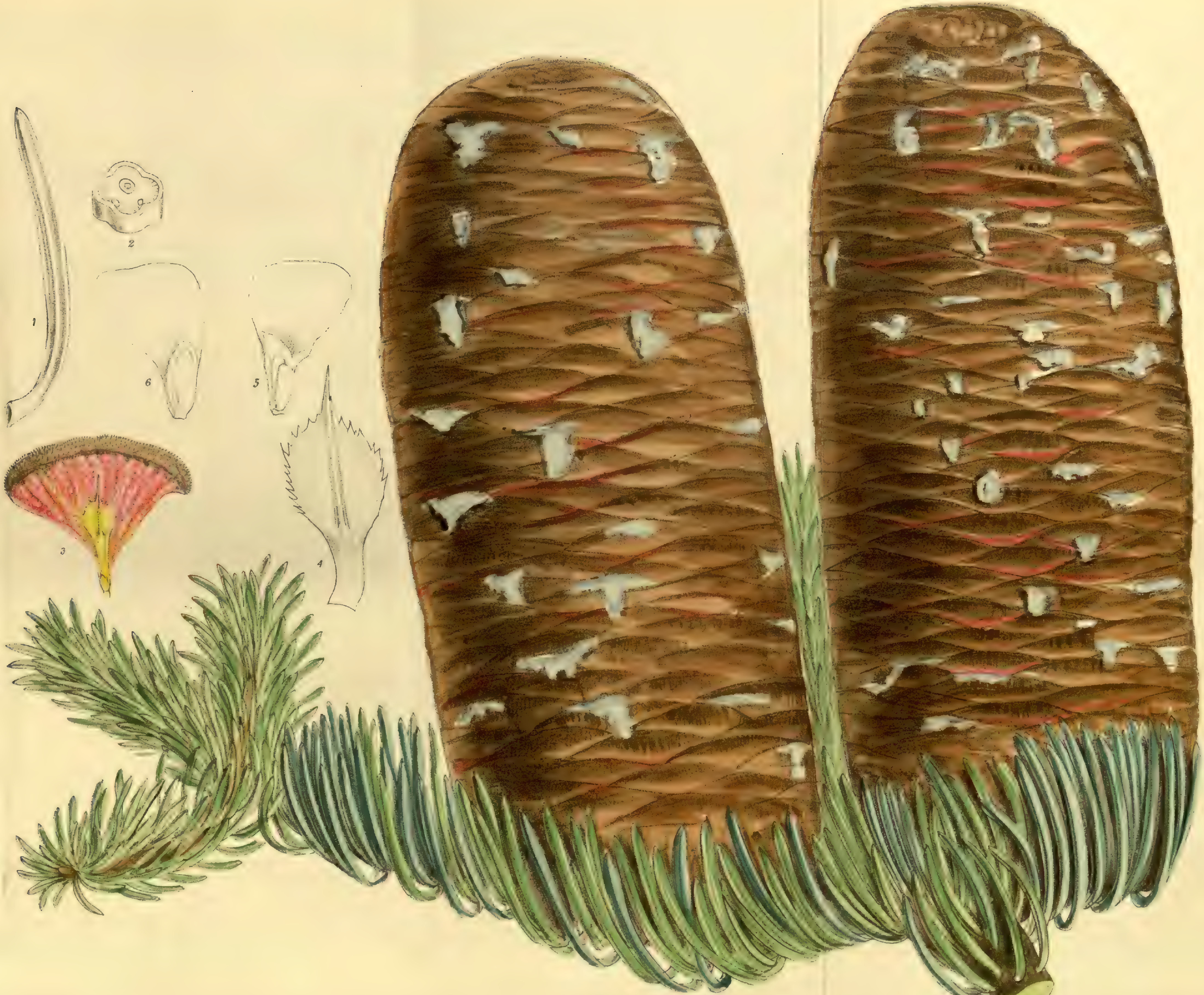

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TAB. 8552.

ABIES MAGNIFICA.

North-Western United States.

CONIFERAE. Tribe ABIETINEAE.

ABIES, *Juss.* (*ex parte*); *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 441.; *Eichl. in Engl. & Prantl, Natürl. Pflanzenfam.* vol. ii. pars i. p. 81.

Abies magnifica, *A. Murray in Proc. Roy. Hort. Soc.* vol. iii. (1863) p. 318, figs. 25–33; *Masters in Gard. Chron.* 1885, vol. xxiv. p. 652, fig. 148; *Sargent, Silv. N. Am.* vol. xii. p. 137, tt. 618, 619; *Elwes & Henry, Trees of Gr. Brit. & Irel.* vol. iv. p. 792; *Clinton Baker, Ill. Conif.* vol. ii. p. 17, cum tt. 2; ab *A. nobili*, Lindl., affini differt foliis minus congestis tetragonis supra haud sulcatis apice obtusis acutisve haud emarginatis, carpellis ovatis vel obovato-ellipticis in planta typica quam squamulae ovuligerae brevioribus in cono maturo haud exsertis.

Arbor ad 75 m. alta, coma apice rotundata, trunco ad 3 m. diametro ad medium fere ramis destituto, cortice arborum diu laevi argenteo-albido deinde profunde fisso 10–15 cm. crasso squamis nigro-rufescentibus; rami pro rata breves, inferiores subpenduli, rigide remote ramulosi, superiores subadscendentes; ramuli robusti, primo anno virescentes, puberuli deinde brunnescentes et glabrati. *Gemmae* ovatae, acutae, 6–8 mm. longae, perulis castaneis exterioribus denticulatis apiculatis. *Folia* per decem annos persistentia, ramorum inferiorum lanceolato-linearia, subplana, obtusa, 1·8–3·8 cm. longa, 1·5 mm. lata, lateralia e basi subhorizontali adscendentia, facialia suberecta vel prorsus curvata; folia ramorum superiorum et ramulorum fertilium crassiora, linearia, sectione transversa subrhombica, apice calloso-acuta vel subacuta, 0·8–3 cm. longa, e basi breviter curvata erecta, dense congesta; folia ramorum terminalium 1·8 cm. longa, acute acuminata, arcuata, apicibus ramo adpressis; omnia glauca vel glauco-viridia, utrinque stomatorum ordinibus instructa. *Strobili masculi* oblongo-cylindrici, 1·2–1·8 cm. longi, rubro-purpurei. *Strobili feminei* oblongi, circiter 3·75 cm. longi, fere 2·5 cm. crassi. *Carpella* sub anthesi elliptica vel obovato-elliptica, denticulata, costa in apiculum vel mucronem producta. *Squamae ovuliferae* sub anthesi quam carpella multo breviores, late ovatae. *Coni* oblongo-cylindrici, apice truncati vel rotundati, 15–23 cm. longi, 6–8·5 cm. diametro, ex purpureo fuscescentes vel nigrescentes, squamae maturae late cuneatae quam carpella vix aucta majores eoque occultantes, circiter 3·5 cm. latae. *Semina* oblique oblonga, 1·5–1·8 cm. longa, ala oblique obovata paulo longiora, pallide purpureo-fuscescentia vel subrosea.—*A. nobilis*, var. *magnifica*, Kellog, Trees of Calif. p. 29. *Picea magnifica*, Gord., Pin. ed. ii. p. 219. *Pinus amabilis*, Parl. in DC. Prodr. vol. xvi. pars ii. p. 246 (ex parte). *P. magnifica*, M'Nab in Proc. R. Irish Acad. ser. 2, vol. ii. p. 700, t. 49, figs. 30, 30a.—O. STAPF.

The Fir here figured is the principal tree in the forest belt of the Sierra Nevada between 6000 and 9000 feet above sea level, extending northwards into the Cascade

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Mountains in Oregon. At the southern limit of its distribution it reaches an altitude of 10,000 feet. It was discovered by Fremont in 1845, probably in the Sierra Nevada, and was first introduced into England by J. Jeffrey in 1851. In this country, however, it has not proved so general a success in gardens as some other Western American species; still, fine specimens are to be found, especially in Scotland. The material for our figure has been made from material kindly furnished by Mr. H. Clinton Baker from his fine pinetum at Bayfordbury. There the tree is over sixty feet in height with a trunk about six feet in girth. This species has been much confused with *A. nobilis*, Lindl., but is readily distinguished, even in the absence of cones, by the leaf being keeled on both surfaces and thus quadrangular in transverse section, whereas the leaf of *A. nobilis* is grooved on the upper surface. As seen in Scotland and other places where it succeeds, *A. magnifica* is a tree of great beauty and distinction, well marked by its slender conical shape. It enjoys a deep, moist, loamy soil and a generous rainfall. At Kew, where both these requirements are lacking, and where it has besides to contend against adverse atmospheric conditions, it is a failure. The light red-brown wood is comparatively durable; its main use, however, is for fuel. There is a variety which occurs on Mt. Shasta, and has been termed *shastensis* by Lemmon, which is characterised by its mature cones having bracts that are longer than the seed-bearing scales; they are golden-yellow and their exserted tips are more or less reflexed.

DESCRIPTION.—*Tree* up to 250 ft. high, crown round-topped, trunk up to 10 ft. thick, almost devoid of branches to the middle; bark of adult trees long remaining silvery white and smooth, but in time deeply cracking, 4–6 in. thick, with the segments blackish-red; branches short for the height of the tree, the lower ones almost pendulous, stiff and distantly twiggy, the upper ones somewhat ascending; twigs stout, greenish and puberulous the first season, then becoming brownish and nearly glabrous. *Leaf-buds* ovate, acute, $\frac{1}{4}$–$\frac{1}{3}$ in. long, the outer scales chestnut-brown, denticulate and apiculate. *Leaves* persisting for ten seasons; those of the lower branches lanceolate-linear, nearly flat, obtuse, $\frac{3}{4}$–$1\frac{1}{2}$ in. long, under $\frac{1}{12}$ in. wide, the lateral ones ascending from a nearly horizontal base, the facial ones erect or curved throughout their length; those of the upper branches and of the fertile twigs stouter, linear, somewhat rhomboid or tetragonal in cross-section, callous and acute or subacute at the tip, $\frac{1}{3}$–$1\frac{1}{4}$ in. long, at the base shortly curved, then erect, densely clustered; those of the terminal branches $\frac{3}{4}$ in. long, acutely acuminate, curved till their tips touch the branch; all glaucous or glaucous-green, beset with rows of stomata on both sides. *Male cones* oblong-cylindric, $\frac{1}{2}$–$\frac{3}{4}$ in. long, reddish-purple. *Female cones* oblong, about $1\frac{1}{2}$ in. long, nearly 1 in. thick. *Carpels* when flowering elliptic or obovate-elliptic, denticulate, the midrib produced in a mucro; ovule-bearing scales wide ovate, in flower much shorter than the carpels. *Mature cones* oblong-cylindric, truncate or rounded at the apex, 6–9 in. long, $2\frac{1}{2}$–$3\frac{1}{3}$ in. wide, from tawny-purple to blackish; ripe scales wide cuneate, larger than and hiding the very slightly altered carpels, about $1\frac{1}{3}$ in. wide. *Seed* obliquely oblong, $\frac{2}{3}$–$\frac{3}{4}$ in. long, wing oblique-obovate, rather longer than the body of the seed, pale tawny-purple or almost rose-coloured.

Fig. 1, a leaf; 2, transverse section of a leaf; 3, scale and bract; 4, scale; 5 and 6, seeds:—*all enlarged except 3, which is of natural size.*

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TAB. 8553.

ZEPHYRANTHES CARDINALIS.

America.

AMARYLLIDACEAE. Tribe AMARYLLEAE.

ZEPHYRANTHES, *Herb.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 723.

Zephyranthes cardinalis, *C. H. Wright*; species *Z. concolori*, Benth. et Hook. f., affinis, pedicello breviore, spatha breviore anguste tubulari perianthioque cardinali differt.

Herba. *Folia* ligulata, acuminata, 14 cm. longa, 7 mm. lata, supra nitide viridia, leviter canaliculata, subtus carinata. *Scapus* cylindricus, 11 cm. altus, 3 mm. diametro, inferne roseus, superne viridis; spatha rosea, tubus subinflatus, 15 mm. longus, apex 11 mm. longus, acutus; flos inclinatus; pedicellus 2 cm. longus. *Perianthium* cardinale; tubus infundibuliformis, 2·5 cm. longus, infra viridi-tinctus; segmenta late oblongo-oblanceolata, subobtusa, apice incrassata, erecto-patentia. *Stamina* ad medium perianthii segmentorum attingentia; antherae oblongae, lilacinae. *Ovarium* breviter ellipticum; stigma trilobum.—C. H. WRIGHT.

The handsome Amaryllid which is here described has all the facies of a species of *Hippeastrum* referable to the section *Habranthus*. Yet the nature of the spathe, which is monophyllous and tubular at the base, excludes it from *Hippeastrum*, a genus in which the spathe is bilobed to the very base, and shows that it is really a *Zephyranthes*. Within *Zephyranthes* it may best be placed in the section *Zephyrites* where the flower is inclined and the style is somewhat declinate. The plant from which our figure has been prepared is one which flowered at Kew in June, 1913. The bulb was presented by Mr. E. S. Miller of Wading River, New York, to his friend Mr. J. G. Baker in January, 1913, and by Mr. Baker was made over to Kew. Mr. Miller informs us that the plant has reached him from the Bahama Islands where it is grown in gardens, but that he has failed to learn of any locality in which the species is indigenous. At Kew the species thrives well under the cultural treatment suitable for *Z. carinata*, Herb. which is figured at t. 2594 of this work. Its leaves appear in October, but so far it has not produced seeds at Kew.

MAY, 1914.

DESCRIPTION.—*Herb.* *Leaves* ligulate, acuminate, 5½ in. long, ¼–⅓ in. wide, shining green and slightly channelled above, keeled beneath. *Scape* cylindric, 4½ in. long, ⅛ in. thick, rose-pink near the base, green upwards; spathe rose-pink, its tube somewhat inflated, ⅔ in. long, its tip acute, nearly ½ in. long; flower bent to one side, its pedicel ¾ in. long. *Perianth* bright-red; tube funnel-shaped, 1 in. long, greenish near the base; segments broadly oblong-oblanceolate, somewhat blunt, thickened at the tip, very slightly spreading. *Stamens* reaching the middle of the perianth-lobes; anthers oblong, lilac. *Ovary* shortly elliptic; stigma 3-lobed.

Figs. 1 and 2, anthers; 3, stigma:—*all enlarged.*

M.S del. J.N.Fitch lith.

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TAB. 8554.

MAZUS REPTANS.

Himalaya.

SCROPHULARIACEAE. Tribe GRATIOLEAE.

MAZUS, *Lour.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 947.

Mazus reptans, *N. E. Brown*; species nova affinis *M. surculoso*, Don, sed glabrior, internodiis brevioribus, foliis minoribus angustioribus et acutioribus oppositis nec rosulatis et corollae tubo calyce longiore differt.

Herba perennis caespitosa, ad 3–5 cm. alta. *Caules* repentes radicantes, 1 mm. crassi internodiis 5–25 mm. longis, glabri. *Folia* opposita, cum petiolo 1·5–2·5 cm. longa, 4–9 mm. lata, lanceolata oblanceolata vel subelliptica, acuta, utrinque 2–3-dentata, infra medium in petiolum angustius alatum attenuata, glabra, subtus secus costam glandulis minutissimis conspersa. *Racemi* 2–5-flori, erecti, 4–5 cm. longi, e basi florentes. *Pedicelli* 0·8–2 cm. longi, erecti, graciles, unifariam pubescentes, minute unibracteati. *Calyx* 5–6 mm. longus, ad medium vel infra 5-lobus, sparse glanduloso-puberulus; lobi patuli, lanceolati vel elongato-deltoideo-ovati, acuti. *Corolla* inaequaliter bilabiata, purpureo-coerulea, labio inferiore albo luteo et rubro-purpureo variegato; tubus 7–8 mm. longus, minutissime glandulosus; labia porrecta; labium superius levissime recurvum, 8–10 mm. longum, basi 3·5 mm. latum, apice bifidum; labium inferius 1–1·3 cm. longum, 1 cm. latum, subplanum, 3-lobum, disco bicalloso callis albo-pilosis; lobi anguste oblongi, obtusi. *Stamina* 4, didynama, 2 inferioribus breviter exsertis; filamenta glabra. *Stylus* filiformis, glaber, albus; stigma incrassatum, 2-lobum.—*M. rugosus*, Gard. Chron. 1913, vol. liii. pp. 158, 190, 210 cum icon.; nec Lour. *Mazus* sp., Colchester in Gard. Chron. l.c. p. 240.—N. E. BROWN.

The very interesting little Scropulariad here figured is one for whose introduction to English gardens we are indebted to Mr. B. Crisp, of the Wargrave Plant Farm, Limited, by whom it was shown at a meeting of the Royal Horticultural Society on March 4, 1913, where it was accepted by those responsible as *Mazus rugosus*, Lour. It is a member of the genus *Mazus*, but it is singularly unlike *M. rugosus*, though, according to Mr. Crisp, like *M. rugosus* it is a native of the Himalaya. There is not, however, in any of the collections we have examined, a Himalayan specimen which in habit is at all like the species now figured, though a form with the same general facies but with different foliage occurs in the Khasia Hills to the east of the Himalaya. For the

MAY, 1914.

plant from which the figure now given was prepared, Kew is indebted to the kindness of Mr. Crisp; usually in habit it is more compactly matted than the individual shown in our plate. *M. reptans* is an extremely pleasing little plant, rather resembling in general appearance some of the smaller Lobelias. It grows freely and flowers almost continuously from early spring to late autumn in any sheltered nook in the rock garden or in a shallow pot in a cold frame.

DESCRIPTION.—*Herb*, perennial, tufted, 1–2 in. high; stems prostrate, rooting at the nodes, very slender, internodes $\frac{1}{4}$–1 in. long, glabrous. *Leaves* opposite, including the petiole $\frac{2}{3}$–1 in. long, $\frac{1}{6}$–$\frac{1}{3}$ in. wide, lanceolate, oblanceolate or almost elliptic, 2–3-toothed along each side, narrowed from the middle downwards in a rather narrow winged petiole, glabrous but very minutely glandular along the midrib beneath. *Racemes* 2–5-flowered, erect, 1$\frac{3}{4}$–2 in. long, flowering from the very base; pedicels $\frac{1}{3}$–$\frac{3}{4}$ in. long, erect, slender, 1-fariously pubescent, minutely 1-bracteate. *Calyx* $\frac{1}{5}$–$\frac{1}{4}$ in. long, 5-lobed to the middle or deeper, sparingly glandular puberulous; lobes spreading, lanceolate, rather long deltoid-ovate, acute. *Corolla* unequally 2-lipped, purplish blue, the lower lip blotched with white, yellow and red-purple; tube $\frac{1}{4}$–$\frac{1}{3}$ in. long, very finely glandular; lips outspread, the upper slightly recurved, $\frac{1}{3}$–$\frac{2}{5}$ in. long, $\frac{1}{7}$ in. wide at the base, 2-fid at the tip, the lower $\frac{2}{5}$–$\frac{1}{2}$ in. long, $\frac{2}{5}$ in. wide, almost flat, with the disk 2-callose, the ridges white-pilose, the lobes narrow-oblong, obtuse. *Stamens* 4, didynamous, the lower pair shortly exserted; filaments glabrous. *Style* filiform, glabrous, white; stigma large, 2-lobed.

Fig. 1, calyx and pistil; 2, corolla laid open, showing stamens; 3, hairs on the corolla; 4 and 5, anthers; 6, pistil, with portion of calyx:—*all enlarged*.

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TAB. 8555.

LONICERA LEDEBOURII.

California.

CAPRIFOLIACEAE. Tribe LONICEREAE.

LONICERA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 5.

Lonicera Ledebourii, *Eschscholtz in Mém. Acad. Sci. St. Pétersb.* vol. x. p. 284; *DC. Prodr.* vol. iv. p. 336; *Hook. et Arnott Bot. Beechey Voy.* p. 143; *Neumann in Rev. Hort.* ser. 2, vol. ii. p. 373, cum icon.; *Regel, Gartenfl.* vol. ii. p. 289, t. 64; *K. Koch. Dendr.* vol. ii. p. 35; *Dippel, Handb. Laubholzk.* vol. i. p. 258, t. 171; *Koehne, Deutsch. Dendr.* p. 544; *Rehder in Rep. Missouri Bot. Gard.* vol. xiv. p. 100; *Schneider, Ill. Handb. Laubholzk.* vol. ii. p. 705, t. 448, figs. e–f; affinis *L. involucratae*, Banks, sed ramis longioribus foliis infra pubescentibus basi interdum rotundatis corollae tubo extra rubro-luteo, lobis patulis antheris vix exsertis differt.

Frutex erectus; rami elongati, interdum usque ad 5 m. longi; ramuli angulati, juniores parce puberuli. *Folia* lanceolata vel ovato-lanceolata, subacuta vel breviter mucronata, basi obtusa vel rotundata, 4–8 cm. longa, 1·5–2·5 cm. lata, integra, tenuiter chartacea, supra nervis puberula, infra molliter pubescentia, reticulata, nervis lateralibus utrinque 5–6 ascendentibus arcuatis; petioli 0·5 cm. longi, parce puberuli. *Flores* geminati, intra involucrum longe pedunculatum e bracteis duabus sessiles; pedunculi 2–2·5 cm. longi, glabri. *Bracteae* oppositae, distinctae, ovatae vel ovato-ellipticae, apice obtusae, sub anthesin circiter 1 cm. longae et 0·8 cm. latae, extra reticulatae, parce pilosae, intra et marginibus stipitato-glandulosae, primum rubro-virides, in fructu purpureae et accrescentes; bracteolae parvae. *Calyx* obsoletus. *Corolla* infundibuliformis, basi saccata, extra rubro-lutea, intra lutea; tubus 1–1·5 cm. longus, circiter 0·5 cm. diametro, extra parce pilosus; limbus 5-lobus, lobis patulis late ovato-rotundatis 3 mm. latis. *Stamina* 5, supra medium tubi inserta; antherae vix exsertae, mucronatae. *Ovarium* glabrum; stylus crassus; stigma capitatum, breviter exsertum. *Bacca* nigra. — *Chamaecerasus Ledebourii*, Billiard, L'Hort. Franç. 1861, p. 256. *Lonicera intermedia*, Kellogg, Proc. Calif. Acad. vol. i. p. 154, fig. 47. *Caprifolium Ledebourii*, Kuntze, Rev. Gen. Pl. vol. i. p. 274. *Distegia Ledebourii*, Greene, Man. Bot. San Francisco Bay, p. 164. *Xylosteum Lebebourii*, Howell, Fl. N.W. Am. vol. i. p. 282.—J. HUTCHINSON.

The *Lonicera* described above is a shrub of sturdy erect habit, ultimately attaining a height of six to nine feet and being as much across. Its deep orange-yellow flowers, tinged with red, appear in late May and June, and make the shrub very handsome then. It is very easily cultivated, thriving in a deep loamy soil and in a sunny position. Introduced in 1838 from California, it

seems to be widely spread in gardens, if one may judge by the number of specimens submitted for identification in each succeeding year. It can be increased by cuttings in early autumn. The only species in gardens with which it is likely to be confused is the well-known *L. involucrata*, Banks, which has similarly striking involucres. The latter is, however, easily distinguished by its thinner, glabrous or nearly glabrous leaves, and its longer stamens, and it is as a rule in herbaria not in gardens that any serious difficulty is experienced in separating the two. The material for our plate was supplied by a plant which has long been in cultivation at Kew.

DESCRIPTION.—*Shrub*, erect; branches long, at times up to 15 ft. long, twigs angular, when young sparingly puberulous. *Leaves* lanceolate or ovate-lanceolate, rather acute or shortly mucronate, base rounded or truncate, $1\frac{3}{4}$–$3\frac{1}{2}$ in. long, $\frac{2}{3}$–1 in. wide, entire, thinly papery, puberulous on the nerves above, softly pubescent underneath, reticulately veined, the lateral nerves curved, ascending, 5–6 on each side; petioles $\frac{1}{5}$ in. long, sparingly puberulous. *Flowers* geminate, sessile between two bracts in a long-peduncled involucre; peduncles $\frac{3}{4}$–1 in. long, glabrous. *Bracts* opposite, distinct, ovate or ovate-elliptic, blunt-tipped, in flower about $\frac{2}{5}$ in. long and $\frac{1}{3}$ in. across, reticulate outside and sparingly pilose, beset with stalked glands within and on the margin, at first reddish-green, in fruit purple and accrescent; bracteoles small. *Calyx* obsolete. *Corolla* funnel-shaped, saccate at the base, reddish-yellow outside, yellow within; tube $\frac{1}{3}$–$\frac{2}{3}$ in. long, about $\frac{1}{5}$ in. wide, sparingly hairy outside; limb 5-lobed, lobes spreading, widely ovate-rounded, $\frac{1}{8}$ in. across. *Stamens* 5, inserted above the middle of the tube; anthers hardly exserted, mucronate. *Ovary* glabrous; style stout; stigma capitate, shortly exserted. *Berry* black.

Fig. 1, bract and two flowers; 2, ovaries; 3, section of corolla; 4 and 5, anthers; 6, style and stigma:—*all enlarged.*

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Tab. 8556.

PITHECOCTENIUM cynanchoides.

Brazil to the Argentine.

Bignoniaceae. Tribe Bignonieae.

Pithecoctenium, *Mart.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1038.

Pithecoctenium cynanchoides, *DC. in DC. Prodr.* vol. ix. p. 195; *Bur. & K. Schum. in Mart. Fl. Bras.* vol. viii. pars 2, p. 166; foliis parvis caudato-acuminatis distinctum.

Frutex scandens. *Ramuli* graciles, quadrangulares, 6-costati, novelli minute puberuli, mox glabrati. *Folia* opposita, petiolata, trifoliolata, foliolo terminali saepe in cirrhum apice trifurcatum commutato; petioli 2–3 cm. longi, pilosuli; petioluli similes, saepe longiores; foliola late ovata, acute caudato-acuminata, basi late cordata, 4–5 cm. longa, 3·5–4·5 cm. lata, minute ciliolata, supra sparse minute subtus densius lepidota, lepidibus oculo armato tantum visis. *Racemus* terminalis, pauciflorus; pedicelli circiter 1·5 cm. longi, medio bibracteolati. *Calyx* cupularis, truncatus, nervis productis 5-dentatus, circiter 8 mm. longus dentibus exclusis, extra molliter pilosus, minute densiuscule lepidotus, superne circa nervos minute impresso-glandulosus. *Corolla* alba, intus lutea, tubulari-infundibularis, 4–5 cm. longa, prorsum curvata, limbo patulo. *Stamina* 4, didynama, anteriora longiora, ut staminodium posticum circiter 7 mm. supra basin corollae inserta; filamenta basi incrassata, pilis moniliformibus villosissima; antherae loculis discretis late divergentibus oblongis vix 3 mm. longis. *Ovarium* compresso-ellipsoideum, breviter tomentellum, biloculare, disco magno pulvinari insidens; placentae pro loculo 2, multiovulatae, ovulis pluriseriatis; stylus supra ovarium valde contractus deinde incrassatus; stigmatis lobi plani, foliacei. *Capsula* oblonga utrinque angustata, 7–8 cm. longa, appendice septi capitato terminata, valvis more limae muriculatis. *Semina* transverse inserta, plana, hyalino-alata, corpore ambitu pyriformi.—*P. clematideum*, Griseb. Symb. Fl. Argent. p. 257. *Anemopaegma clematideum*, Griseb. Pl. Lorentz. p. 174.—T. A. Sprague.

The Bignoniad here figured has been in cultivation at Kew since 1884, when its seeds were presented by Dr. Dormer, who collected them to the west of the Argentine Republic. It flowered for the first time in 1895, and has frequently flowered in summer since. The genus *Pithecoctenium* to which it belongs is one of the best characterised in the natural family *Bignoniaceae*; it may be recognised at once by the capsule, which is variously muricate or tuberculate outside and is terminated by a capitate appendage of the septum; the young branches always have about six prominent ribs which are subsequently thrown off. Our species,

P. cynanchoides, has a fairly wide distribution, for it is known from the neighbourhood of Rio in Brazil, from Paraguay, Uruguay and the north-west of the Argentine Republic. As in many other Bignoniads the terminal leaflet of the 3-foliolate leaves is replaced, in actively growing parts of the stem, by a 3-furcate tendril. The species thrives well in a temperate house under the conditions suitable for some of the species of *Bignonia.*

DESCRIPTION.—*Shrub*, climbing; twigs slender, 4-angled and 6-ribbed; young shoots finely puberulous, soon glabrous. *Leaves* opposite, petioled, 3-foliolate, the end leaflet often replaced by a tendril with a 3-furcate tip; petiole ¾–¼ in. long, finely pilose; petiolules similar and often longer; leaflets wide-ovate, acutely caudate-acuminate, base wide-cordate, 1½–2 in. long, 1⅓–1¾ in. wide, finely ciliolate, under a lens closely minutely lepidote beneath, very sparingly so above. *Raceme* terminal, few-flowered; pedicels about ⅔ in. long, 2-bracteolate in the middle. *Calyx* cupular, truncate, minutely 5-toothed owing to the nerves being produced, excluding the teeth about ⅓ in. long, softly hairy outside, minutely closely lepidote, in the upper part finely sunk-glandular about the nerves. *Corolla* white, yellow within, tubular funnel-shaped, 1¾–2 in. long, curved throughout. limb spreading. *Stamens* 4, didynamous, the anterior the longer, all inserted, as is the staminode, about ¼ in. above the base of the corolla; filaments thickened at the base, quite villous with moniliform hairs; anther-cells discrete, wide diverging, oblong, hardly ⅛ in. long. *Ovary* compressed-ellipsoid, shortly tomentellous, 2-locular, resting on a large cushion-like disk; placentae 2 to a cell, many-ovuled, ovules many-seriate; style much contracted above the ovary, then thickened higher up; stigmatic lobes flat, leafy. *Capsule* oblong, narrowed to both ends, about ⅓ in. long, crowned with a 7-headed appendix, valves muriculate resembling a file. *Seeds* inserted transversely, flat, with a hyaline wing; body of the seed pyriform in outline.

Fig. 1, calyx; 2, stamens and their insertion; 3, hair from base of filament 4, anther; 5, pistil and disk:—*all enlarged.*

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BOTANICAL MAGAZINE.

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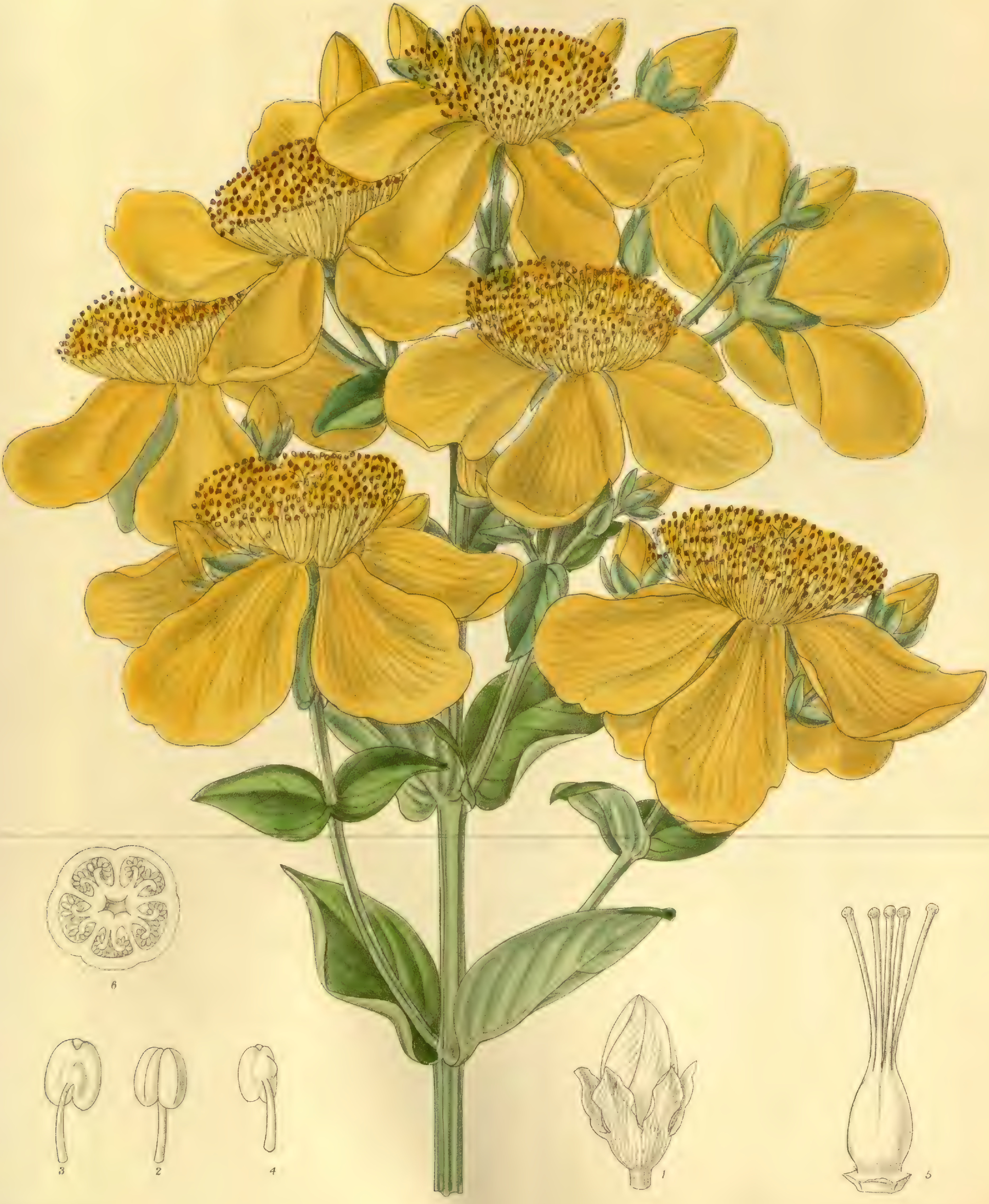

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TAB. 8557.

HYPERICUM ASCYRON.

North America and Eastern Asia.

HYPERICACEAE. Tribe HYPERICEAE.

HYPERICUM, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 165.

Hypericum Ascyron, *Linn. Sp. Pl.* vol. ii. p. 783; *Maxim. in Mél. Biol.* vol. xi. p. 162; *Hemsl. in Journ. Linn. Soc. Bot.* vol. xxiii. p. 72; *J. M. Coulter in A. Gray, Syn. Fl. N. Am.* vol. i. pars 1, p. 284; floribus maximis, petalis obliquis, stylis 5, stigmatibus capitatis distinctum.

Planta erecta, circiter 1 m. alta, superne ramosa. *Caulis* quadrangularis, circiter 6 mm. crassus, angulis leviter alatis; ramuli stricti, ascendentes, superiores apice flores solitarios vel cymas trifloras gerentes. *Folia* sessilia, patula, semiamplexicaulia, ovato-oblonga, acuta, 3·5–5·5 cm. longa, 1–2·5 cm. lata, versus apicem leviter recurva, subcoriacea, glabra, nervis supra impressis subtus prominentibus. *Pedunculi* 1·5–3·5 cm. longi, superne bibracteati, rarius unibracteati. *Sepala* ovato-oblonga, 1·3–1·4 cm. longa, 7–9 mm. lata, acute apiculata, crispata. *Petala* leviter deflexa, oblique obovata, 4–5 cm. longa, 2·5–3 cm. lata. *Stamina* numerosissima, inconspicue quinquephalangiata, 1·5–2·7 cm. longa; antherae breviter oblongae, curvatae, versatiles, glandula apicali. *Ovarium* ovoideum, 1·2 cm. longum, quinquesulcatum, inferne quinqueloculare, superne uniloculare, placentis valde intrusis bifidis multiovulatis; styli 5, liberi, 1·2 cm. longi, stigmatibus capitatis. *Capsula* ovoideo-conica, circiter 2 cm. longa. *Semina* teretia, raphe leviter alata.—*H. pyramidatum*, Ait. Hort. Kew. vol. iii. p. 103. *H. ascyroides*, Willd. Sp. Pl. vol. iii. p. 1443. *H. macrocarpum*, Michx Fl. Bor.-Am. vol. ii. p. 82.—T. A. SPRAGUE.

The very striking St. John's Wort here described has two widely separated areas of distribution. It occurs in north-eastern North America, where it is met with on the banks of rivers from Quebec and New Jersey in the east to Manitoba and Kansas in the west. It occurs again in Central and Eastern Asia, where, according to Komarov, it extends from the Altai region to Kamschatka, Manchuria, Korea, China, Japan and Formosa. The plant figured, which was presented to the Kew collection by Mr. M. L. de Vilmorin, was raised from seeds obtained in Korea, and represents a rather distinct form with unusually large flowers, which is from a cultural standpoint superior to the ordinary plant in which the flowers are from two to two and a half inches across. At Kew *H. Ascyron*, in all its forms, is only partially woody. It sends up erect stems, three to four feet in height, each of which produces in July and August a very large and striking terminal corymb of flowers. After the fading of its flowers the plant becomes somewhat unkempt and during the winter the stems die back to ground level; after a few years it is rather apt to die out entirely. It is, however, readily propagated by seeds. The plant thrives best in a loamy soil.

DESCRIPTION.—*Herb*, half-woody, 3–4 ft. high. *Stem* erect, 4-angled, $\frac{1}{4}$ in. thick, angles faintly winged; twigs strict, ascending, the upper bearing at the tips either solitary flowers or 3-flowered cymes. *Leaves* sessile, spreading, partially stem-clasping, ovate-oblong, acute, $1\frac{1}{2}$–$2\frac{1}{4}$ in. long, $\frac{2}{5}$–1 in. wide, slightly recurved near the tip, somewhat coriaceous, glabrous, the nerves sunk above and raised beneath. *Peduncles* $\frac{2}{3}$–$1\frac{1}{2}$ in. long, 2-bracteate above, rarely only 1-bracteate. *Sepals* ovate-oblong, over $\frac{1}{2}$ in. long, about $\frac{1}{3}$ in. wide, sharply apiculate, crispate. *Petals* slightly deflexed, obliquely obovate, $1\frac{3}{4}$–2 in. long, 1–$1\frac{1}{4}$ in. across. *Stamens* very many, indistinctly arranged in five groups, $\frac{2}{3}$–1 in. long; anthers shortly oblong, curved, versatile, with a glandular tip. *Ovary* ovoid, $\frac{1}{2}$ in. long, 5-grooved, in the lower part 5-chambered, in the upper portion only 1-chambered but with the many-ovuled 2-fid placentas deeply intruded; styles 5, free, $\frac{1}{2}$ in. long; stigmata capitate. *Capsule* ovoid-conic, about $\frac{3}{4}$ in. long. *Seeds* terete; raphe slightly winged.

Fig. 1, flower-bud; 2, 3 and 4, anthers; 5, pistil; 6, transverse section of the ovary:—*all enlarged.*

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TAB. 8558.

VITIS THUNBERGII.

China and Japan.

AMPELIDACEAE. Tribe VITOIDEAE.

VITIS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 387, *partim*; *Planch. in DC. Monogr.* vol. v. pars 2, p. 321, *emend.*

Vitis Thunbergii, *Sieb. & Zucc. Fl. Jap. Fam. Nat.* sect. 1, p. 90; *Planch. in DC. Monogr.* vol. v. pars 2, p. 333; affinis *V. Labruscae*, Linn., a qua nodis tertiis cirrhis (vel inflorescentiis) carentibus, necnon fructibus minoribus recedit.

Frutex scandens. *Rami* subangulati, exsiccando costati. *Folia* alterna, duo sequentia cirrho (vel inflorescentia) se opponentia, tertium ramulum axillarem suffulciens, ultra medium palmatifida, 10–15 cm. diametro, supra glabra nervis et venulis impressis, subtus tomentosa vel pubescentia, nervis prominentibus lobis 3–5 basi angustatis grosse serratis, terminali rhomboideo-elliptico; petioli 3–5 cm. longi. *Thyrsi* oppositifolii, ramo infimo in cirrhum mutato. *Flores* in apicibus ramulorum rhachis subfasciculati, parvi, virides. *Calyx* breviter cupularis, repando-dentatus. *Corolla* in alabastro depresso-truncata; petala 5, valvata, in calyptram deciduam cohaerentia. *Stamina* 5, petalis opposita; antherae introrsae. *Glandulae* interstaminales 5, parva, hypogyna. *Ovarium* subglobosum, biloculare; stylus brevis, stigmate leviter bifido; ovula pro loculo 2, erecta. *Baccae* ovoideae vel ellipsoideae, circiter 1 cm. longae, purpureo-nigrae. *Semina* 1–3.—*Vitis Labrusca*, Franch. et Savat. Enum. Pl. Jap. vol. i. p. 83: Hemsl. in Journ. Linn. Soc. Bot. vol. xxiii. p. 134; non Linn.—T. A. SPRAGUE.

The Vine which is the subject of our notice is a native of Eastern Asia, extending from Corea and China to Japan and Formosa. In this area it is the species which represents the North American *Vitis Labrusca*, Linn., to which it is very closely allied, and in which it has actually been included by a botanist so distinguished as the late Mr. Franchet. In the Asiatic *V. Thunbergii*, however, the fruits are so much smaller that it can hardly be confused with its American congener, while the observant grower will further be able to separate the two plants, owing to the circumstance that in the American Fox-Grape a tendril, or in the absence of a tendril, its homologue, an inflorescence, is to be met with opposite each leaf, whereas in the Japanese plant, while there is a tendril or an inflorescence opposite two successive leaves, none will be found opposite the third leaf. As a climber whose foliage dies off at the close of the season in rich

red shades, *V. Thunbergii* is particularly suitable for gardens in the western parts of the British Islands, and in that of Canon Ellacombe, at Bitton, near Bristol, to whose kindness we are indebted for the material for our plate, this species is a very pleasing object. At Kew it is hardy but is not of very vigorous growth, and never forms stems more than eight feet long. The present figure, it is hoped, may assist in the removal of an almost inexplicable confusion which has crept into English collections as regards the incidence of the name *V. Thunbergii*, which at present is rather persistently, but quite improperly, applied to a very fine form of *V. Coignetiae*, Pulliat, originally introduced from the East into Mr. A. Waterer's nursery. This latter plant, so often grown as *V. Thunbergii*, is remarkable for the size and the wonderfully rich autumnal colouring of its leaves. The true *V. Thunbergii*, now figured, is very distinct in its much smaller, deeply lobed leaves. It grows well in rich loam and can be increased by "eyes" in the manner usual for vines.

DESCRIPTION.—*Shrub*, climbing; branches somewhat angular, ribbed when dry. *Leaves* alternate, two in succession opposite a tendril or an inflorescence, the third subtending an axillary branch, palmatifid to beyond the middle, 4–6 in. across, glabrous above with the nerves sunk, tomentose or pubescent with the nerves raised beneath; lobes 3–5, narrowed to the base, their margins coarsely toothed, the end-lobe rhomboid-elliptic; petioles 1¼–2 in. long. *Inflorescences* leaf-opposed, the lowest branch modified as a tendril. *Flowers* small, green, fascicled at the tips of the twigs of the rhachis. *Calyx* shortly cup-shaped, repand-toothed. *Corolla* depressed-truncate in bud; petals 5, valvate, united in a deciduous calyptra. *Stamens* 5, opposite the petals; anthers introrse; interstaminal glands 5, small, hypogynous. *Ovary* subglobose, 2-celled; style short; stigma slightly 2-fid; ovules 2 to each cell, erect. *Berry* ovoid or ellipsoid, over ⅓ in. long, purplish-black. *Seeds* 1–3.

Fig. 1, flower-bud; 2, the same, corolla removed; 3, pistil and interstaminal glands; 4 and 5, anthers:—*all enlarged.*

8559.

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Tab. 8559.

DEUTZIA MOLLIS.

China.

Saxifragaceae. Tribe Hydrangeae.

Deutzia, *Thunb.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 642.

Deutzia mollis, *Duthie in Gard. Chron.* 1906, vol. xl. p. 238; *Rehder in Sargent, Pl. Wilson.* vol. i. p. 13; *C. Schneider, Laubholzk.* vol ii. p. 930; inter species sectionis *Mesodeutziae* indumento molli in foliorum pagina inferiore e pilis stellatis quorum radius centralis elongatus patulus constituto et filamentis edentatis distincta.

Frutex ad 0·6–1·5 m. altus, ramis teretibus novellis pilosis citissime glabratis cortice tenui rubro-brunneo vel demum fusco mox soluto tectis; gemmae ovatae, acutae, perulis ovato-lanceolatis acutis numerosis castaneis diu ad innovationum bases persistentibus. *Folia* ovata vel late lanceolata, acuta, basi rotundata, glanduloso-serrata, 5·5–7·5 cm. longa, 2·5–5·5 cm. lata, supra pilis stellatis adpressis plerumque 4–5-radiatis conspersa, infra indumento molli e pilis stellatis constituto quorum radius centralis valde elongatus patet; petiolus hirsutus, 0·5–1 cm. longus. *Inflorescentia* multiflora, corymbosa, corymbo densiusculo vel denso convexo ad 12 cm. diametro, ramis ramulisque stellato-hirsutis, pedicellis 3–4 mm. longis pilis stellatis adpressis canescentibus. *Receptaculum* turbinatum, 2 mm. altum, indumento stellato adpresso incanum. *Sepala* late ovata, subacuta, superne glabrescentia, 1 mm. longa. *Petala* patentia, late elliptica, obtusa, 6 mm. longa, alba vel roseo-suffusa, extra stellato-pubescentia. *Filamenta* e basi latiore sensim filiformiter attenuata, edentata petalis paulo longiora. *Discus* pruinoso-papillosus, in centro pilis minutis stellatis obtectus. *Styli* 3, quam filamenta breviores. *Capsula* subglobosa, incano-pubescens, sepalis persistentibus coronata, 3·5 mm. diametro.—O. Stapf.

The very distinct and striking *Deutzia* now described is one of the additions to European collections for which horticulture is indebted to Messrs. J. Veitch and Sons, for whom it was discovered by Mr. E. H. Wilson, growing on cliffs near Paokang, in Hupeh, in Central China, in 1901. The material for our plate has been obtained from one of the plants in the nursery of Messrs. Veitch at Coombe Wood, raised from seed originally received from Mr. Wilson. Like most of the species of the genus which will grow at Kew, *D. mollis* is somewhat liable to injury by late frosts in May, but in other respects is quite hardy. It is remarkably distinct from any other species in cultivation in the soft felt-like covering, especially on

the undersurface of the leaves. It thrives in a good loamy soil, and like its congeners is easily increased by cuttings taken in late summer.

Description.—*Shrub*, 2–5 ft. high; branches terete; young shoots hairy but soon becoming glabrous; bark thin, reddish-brown or at length tawny, soon flaking; buds ovate-acute, their scales ovate-lanceolate, acute, rather numerous, chestnut-brown, persisting for a considerable time at the bases of the shoots. *Leaves* ovate or wide lanceolate, acute, rounded at the base, the margin glandular-serrate, $2\frac{1}{4}$–3 in. long, 1–$2\frac{1}{4}$ in. wide, sparingly adpressed hairy with usually 4–5-rayed stellate hairs above, densely clothed beneath with a soft felted tomentum of stellate hairs each of which has a very long central ray; petiole hirsute, $\frac{1}{5}$–$\frac{1}{3}$ in. long. *Inflorescence* many-flowered, corymbose, the corymb more or less dense, convex, $4\frac{1}{2}$ in. across, its main and secondary branches stellate-hairy; pedicels $\frac{1}{8}$–$\frac{1}{6}$ in. long, hoary with adpressed stellate hairs. *Receptacle* turbinate, $\frac{1}{12}$ in. long, hoary with adpressed stellate hairs. *Sepals* wide obovate, somewhat acute, glabrescent above, very short. *Petals* spreading, wide elliptic, blunt, $\frac{1}{4}$ in. long, white or flushed with pink, stellate-pubescent outside. *Filaments* gradually narrowed upwards from a rather broad base, not toothed; in length somewhat exceeding the petals. *Disk* pruinosely papillose, covered in the middle with minute stellate hairs. *Styles* 3, shorter than the filaments. *Capsule* nearly globose, hoary-pubescent, crowned by the persisting sepals, $\frac{1}{7}$ in. in diameter.

Fig. 1, stellate hairs from upperside of leaf; 2, stellate hairs from under-side of leaf; 3, flower-bud; 4, an expanded flower; 5 and 6, stamens:—*all enlarged.*

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TAB. 8560.

TRICYRTIS STOLONIFERA.

Formosa.

LILIACEAE. Tribe UVULARIEAE.

TRICYRTIS, *Wall.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 831.

Tricyrtis stolonifera, *Matsumura in Bot. Mag., Tokyo,* vol. xi. p. 78; species *T. formosanae,* Bak., proxima, caulibus longe stoloniferis differt.

Herba 6 dm. alta, basi stolonifera. *Caulis* teres, basi rubro-purpureus, 6 mm. diametro, dimidio superiore viridis, 2 mm. diametro, primum pubescens, demum glaber. *Folia* elliptico-lanceolata, acuminata, basin vaginatam versus attenuata, 20 cm. longa, 4·5 cm. lata, margine ciliata, supra glabra, nigro-maculata, nervis impressis; nervi laterales utrinque circiter 3, subtus prominentes, primum pubescentes. *Inflorescentiae* pedunculus 12 cm. longus; rami tenues, primum pubescentes. *Perianthium* purpureum, maculis obscuris notatum, basi intus cremeum annulo luteo marginatum; segmenta exteriora elliptica, acuta, 2·5 cm. longa, 1 cm. lata, extra pilosa, basi bilobatim saccata; segmenta interiora lanceolata, obtusa, 2 cm. longa, 3 mm. lata, intus levia, costa extra atropurpurea, utrinque canaliculo pallido instructa. *Stamina* perianthio paullo breviora; filamenta rubro-brunnea, parte superiore maculis luteis notata. *Ovarium* oblongum, glabrum; styli brachia rubro-purpurea luteo-maculata, glandulis stipitatis instructa.—C. H. WRIGHT.

The liliaceous genus *Tricyrtis* includes some ten species, and extends from Japan and Formosa to the Central and Eastern Himalaya. Three of these species have already been figured in this work:—*T. pilosa,* Wall., at t. 4955; *T. hirta,* Hook., at t. 5355; and *T. macropoda,* Miq., at t. 6544. All three have wide cordate or stem-clasping leaf-bases, and thus differ very markedly from the subject of the present illustration, in which the leaves are narrowed gradually to the sheathing base. The species now figured, *T. stolonifera,* is more brightly coloured than any of the other species as yet introduced to gardens, though it is not certain that in this respect it differs at all markedly from its nearest ally, *T. formosana,* Bak., described from specimens collected in Formosa by Mr. R. Oldham. Professor Matsumura, in describing *T. stolonifera,* has distinguished between it and *T. formosana,* by the stoloniferous habit and the spotted perianth of the former. In his field-note, however, Mr. Oldham states that the perianth of *T. formosana* is crimson and

JUNE, 1914.

spotted, while the absence of stolons from his specimens does not necessarily justify the conclusion that the species to which these specimens belong never is stoloniferous. The material for our figure has been obtained from a plant raised at Kew from seeds collected in Formosa by Mr. H. J. Elwes and Mr. W. R. Price, and presented by Mr. Elwes. Mr. Price informs us that the plant grows at altitudes of 7000 feet above sea-level or rather lower, but always in forests. The maximum height of wild plants is about a foot, and the seeds were taken from quite dwarf plants at Karaping. The plants raised from them at Kew have been more luxuriant, reaching a height of two feet. Grown in pots in a cool house, they flowered in September, 1913, but do not promise to be hardy out of doors at Kew, though the species is worthy of a trial in the open in the south-western parts of the United Kingdom.

DESCRIPTION.—*Herb*, 2 ft. high, with stoloniferous base. *Stem* cylindric, below reddish-purple and $\frac{1}{4}$ in. thick, in the upper half greenish, $\frac{1}{12}$ in. thick, at first hairy, at length glabrous. *Leaves* elliptic-lanceolate, acuminate, narrowed to the sheathing base, 8 in. long, 1$\frac{3}{4}$ in. wide, their margin ciliate, above glabrous with dark blotches and sunk nerves; lateral nerves about three along each side, raised and at first pubescent beneath. *Inflorescence* lax; peduncle 5 in. long; branches slender, at first pubescent. *Perianth* purple, indistinctly blotched, base cream-coloured within, with a clear yellow marginal ring; outer segments elliptic, acute, 1 in. long, $\frac{2}{5}$ in. wide, pilose outside and 2-lobately saccate at the base; inner segments lanceolate, obtuse, $\frac{3}{4}$ in. long, $\frac{1}{8}$ in. wide, smooth inside, the midrib dark purple outside, with a pale groove along each side. *Stamens* rather shorter than the perianth; filaments reddish-brown, marked with yellow spots in the upper portion. *Ovary* oblong, glabrous; style-arms red-purple blotched with yellow, and beset with stalked glands.

Fig. 1, pistil showing portion of the base of the flower; 2, outer perianth segment, showing inside of the base; 3 and 4, anthers; 5, sketch of an entire plant:—*all enlarged except 5, which is much reduced.*

8561

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TAB. 8561.

STAPELIA LEENDERTZIAE.

Transvaal.

ASCLEPIADACEAE. Tribe STAPELIEAE.

STAPELIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 784.

Stapelia Leendertziae, *N. E. Br. in Ann. Transvaal Museum*, vol. ii. p. 168; affinis *S. nobilis*, N.E., Br., sed floribus minoribus sordide purpureis corollae tubo multo longiore differt.

Herba succulenta, aphylla. *Caules* erecti, basi decumbentes, 7·5–12 cm. longi, 1–1·3 cm. crassi, 4-angulares, velutino-puberuli, prope medium florentes, angulis subcompressis dentatis, dentibus erectis. *Flores* solitarii vel bini. *Pedicelli* 2–2·3 cm. longi, 4–4·5 mm. crassi, velutini. *Sepala* 8–9 mm. longa, lanceolata vel ovato-lanceolata, acuta, velutina. *Corolla* magna, campanulata lobis leviter patentibus, extra puberula, intus profunde transversim rugosa et usque ad medium tubi pilis longis purpureis ornata, omnino sordide purpurea; tubus 5–6·5 cm. longus, 4·5–6 cm. diametro; lobi 4–5·5 cm. longi, basi 2·5–4 cm. lati, attenuato-deltoidei, acuti, pilis purpureis ciliati. *Coronae* lobi exteriores 4 mm. longi, suberecti, profunde bifidi, atropurpurei, segmentibus divergentibus subulatis acutis; lobi interiores 4 mm. longi inaequaliter bipartiti, atropurpurei, segmentis exterioribus aliformibus oblongis 6 mm. longis 4 mm. latis apice denticulatis, segmentis interioribus subulatis. *Folliculi* 11–14 cm. longi, erecti, paralleli, fusiformi, velutino-puberuli, virides, fusco-purpureo striati.—N. E. BROWN.

The *Stapelia* here figured is one of the most striking species in the genus, and is also one of the most distinct by reason of the great length of the tube of the corolla. In another species, *S. nobilis*, N. E. Br., which has been figured at t. 7771 of this work, there is also a distinct tube to the corolla, but although the flowers are larger in that species than in the ones here described, the tube is considerably shorter, while the lobes are more spreading and the coloration is different. Save in *S. nobilis* and in *S. Leendertziae*, the subject of our plate, the corolla in all the members of the genus is flat or saucer-shaped. This latter plant was first met with in 1909 by Miss R. Leendertz, now Mrs. R. Pott, of the Transvaal Museum, growing among rocks near Heidelberg in the Transvaal. Here it occurs in sunny spots on rocks, where it forms large patches and flowers freely for a long period at the beginning of the year. The

corollas are of a uniform dull, dark, fuscous-purple colour, and have a very disagreeable odour. The plant from which the figure now given was prepared is one sent, in 1910, by Mr. G. Thorncroft, of Barberton, Transvaal, to Mr. W. E. Ledger, of Wimbledon, in whose collection it flowered in August, 1912. Another plant sent by Miss Leendertz flowered subsequently at Kew. Mr. Ledger informs us that he has found the sunny upper shelf of a warm greenhouse the ideal situation for this *Stapelia*; a well-drained soil with an admixture of lime rubbish suits it excellently.

DESCRIPTION.—*Herb*, leafless, succulent. *Stems* erect, decumbent at the base, 3–5 in. long, $\frac{1}{3}$–$\frac{1}{2}$ in. thick, 4-angled, velvety-puberulous, bearing flowers about the middle; the angles slightly compressed, toothed, the teeth erect. *Flowers* solitary or in pairs, their pedicels $\frac{3}{4}$–1 in. long, $\frac{1}{6}$ in. thick, velvety. *Sepals* $\frac{1}{3}$ in. long, lanceolate or ovate-lanceolate, acute, velvety. *Corolla* large, campanulate, with the lobes only slightly spreading, puberulous outside, deeply transversely rugose, and beset as far as the middle of the tube with long purple hairs within, dull fuscous-purple throughout; tube 2–2$\frac{1}{2}$ in. long, 1$\frac{3}{4}$–2$\frac{1}{4}$ in. across; lobes 1$\frac{1}{2}$–2$\frac{1}{5}$ in. long, 1–1$\frac{1}{2}$ in. wide at the base, narrow deltoid, acute, ciliate with purple hairs. *Corona* with outer lobes $\frac{1}{6}$ in. long, suberect, deeply 2-fid, dark purple, the segments diverging, subulate, acute; inner lobes $\frac{1}{6}$ in. long, unevenly 2-partite, dark purple; the outer segments wing-like, oblong, $\frac{1}{4}$ in. long, $\frac{1}{6}$ in. wide, denticulate at the tip, the inner segments subulate. *Follicles* 4$\frac{1}{2}$–5$\frac{1}{2}$ in. long, erect, parallel, fusiform, velvety puberulous, green, streaked with dark purple.

Fig. 1, outer and inner corona; 2, lobe of the inner corona; 3, a pair of pollen masses:—*all enlarged.*

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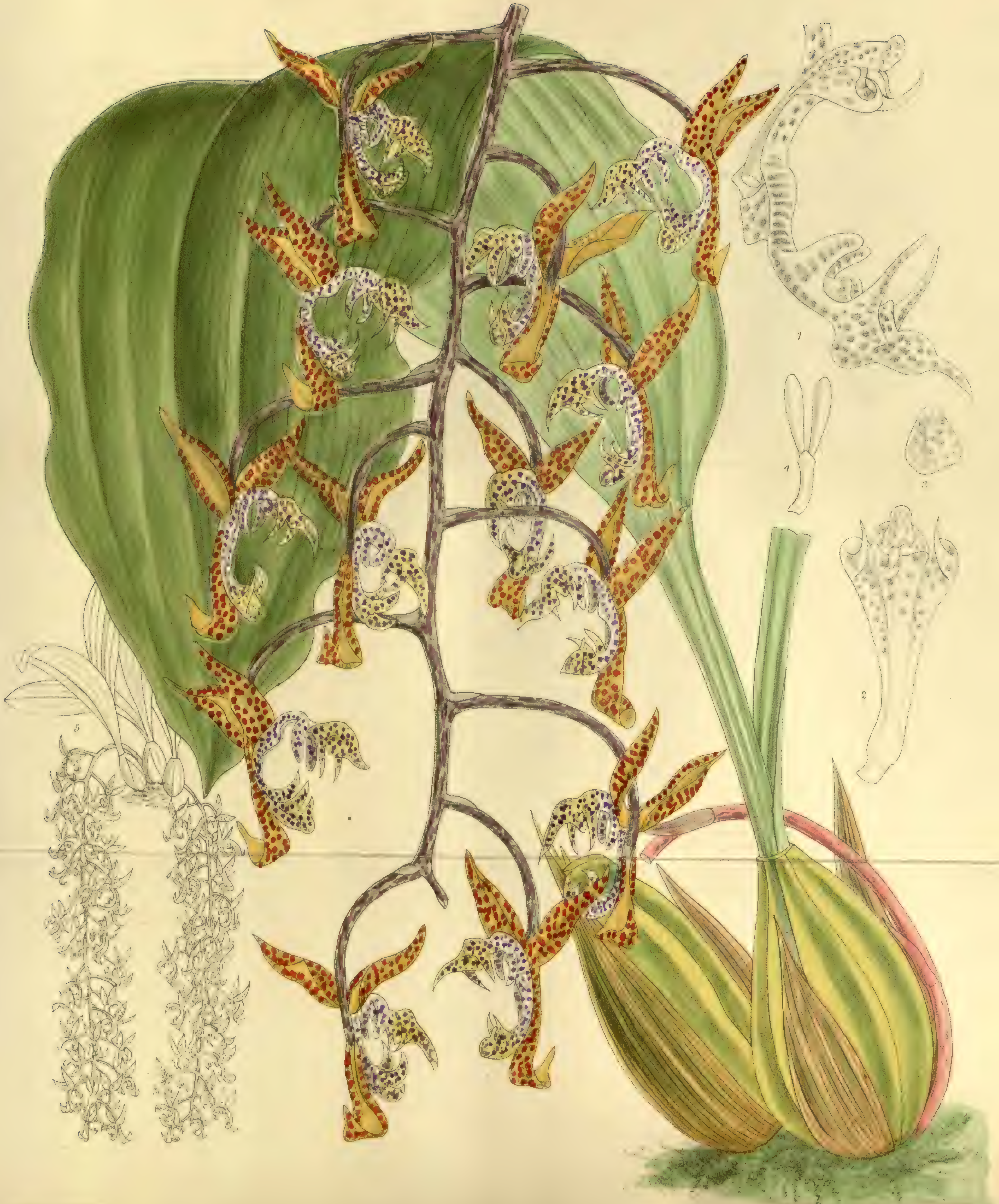

M.S. del. J.N.Fitch lith.

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TAB. 8562.

GONGORA GROSSA.

Ecuador.

ORCHIDACEAE. Tribe VANDEAE.

GONGORA, *Ruiz et Pav.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 549.

Gongora grossa, *Reichb. f. in Gard. Chron.* 1877, vol. vii. p. 781; affinis *G. atropurpureae*, Hook., sed floribus maculatis et labelli cornubus obtusioribus differt.

Herba epiphytica. *Pseudobulbi* aggregati, ovoidei, acute 8-angulati, 5–7 cm. longi, basi vaginis ovatis membranaceis 2–3 cm. longis obtecti, apice diphylli. *Folia* elliptica vel obovato-elliptica, breviter acuminata, plicata, 20–30 cm. longa, 6·5–9 cm. lata. *Scapi* arcuati et penduli, 45–60 cm. longi, basi vaginis paucis lanceolatis obtecti; racemi laxi, multiflori. *Sepalum* posticum oblongo-lanceolatum, acutum, basi columnae adnatum, apice recurvum, circiter 2·5 cm. longum, marginibus revolutis; sepala lateralia reflexa, oblongo-lanceolata, acuta, 2 cm. longa, marginibus revolutis. *Petala* falcato-incurva, ad margines columnae adnata, circiter 1 cm. longa, apice aristato-acuminata et recurva. *Labellum* unguiculatum; limbus angustus, carnosus, compressus, 5-lobus; lobus intermedius triangularis, breviter acuminatus, conduplicato-concavus, 6 mm. longus; lobi laterales longe subulato-aristati, 8 mm. longi; lobi inferi falcato-incurvi, lineari-oblongi, obtusi, 4 mm. longi; discus facie obtuse tricallosi. *Columna* incurva, 1·5 cm. longa, basi angusta, apice clavata, alis falcato-subulatis. *Pollinia* 2, clavato-oblonga; stipes linearis; glandula parvula. —R. A. ROLFE.

The remarkable *Gongora* which we here figure was originally described by the late Professor Reichenbach from a plant, which had been received from Ecuador, that flowered in the collection of the late Sir Charles Strickland, at Hildenley, Malton, nearly forty years ago. That plant appears to have been lost shortly afterwards, and there is no subsequent record of any other example having reached Europe, or of the species as existing in any collection, until in May 1913 a plant flowered at Kew. This plant, which has supplied the material for our plate, is one that was presented to the Kew collection by Mr. Walter Fox, late of Singapore, an old and tried friend of this institution. The plant had been met with by Mr. Fox growing on a Cocoa tree at Tenqual in Ecuador, when he was on a visit to that country in 1911. According to Reichenbach *G. grossa* is the only near ally

of *G. atropurpurea*, Hook., a Guiana species figured at t. 3220 of this work, which has uniformly purple flowers, and shows certain marked structural differences in the lip. At Kew *G. grossa* has thriven well, and has flowered in a teak basket suspended from the roof of the tropical orchid-house. The long elegant racemes are most attractive, and the plant is striking on account of the large size of its leaves and pseudobulbs.

DESCRIPTION.—*Herb*; epiphytic; pseudobulbs clustered, ovoid, acutely 8-angled, 2–2¾ in. long, their bases clothed with ovate, membranous sheaths, with 2 apical leaves. *Leaves* elliptic or obovate-elliptic, shortly acuminate, plicate, 8–12 in. long, 2½–3½ in. wide. *Scapes* curved and pendent, 1½–2 ft. long, clothed at the base with a few lanceolate sheaths; racemes open, many-flowered. *Sepals*: posterior oblong-lanceolate, acute, adnate to the base of the column, recurved at the tip and with revolute margins, about 1 in. long; lateral reflexed, oblong-lanceolate, acute, ¾ in. long, margins revolute. *Petals* falcately incurved, adnate to the edges of the column, about ⅓ in. long, aristate-acuminate at the tip and recurved. *Lip* clawed; limb narrow, fleshy, compressed, 5-lobed; intermediate lobe triangular, shortly acuminate, conduplicate-concave, ¼ in. long; lateral lobes long subulate-aristate, ⅓ in. long; lower lobes falcate-incurved, linear-oblong, blunt, ⅙ in. long; disk bluntly 3-callose on the face. *Column* incurved, ⅗ in. long, base narrowed, tip clavate, wings falcate-subulate. *Pollinia* 2, clavate-oblong; stipe linear; gland small.

Fig. 1, column and lip; 2, column, front view; 3, anther-cap; 4, pollinarium; 5, sketch of an entire plant:—*all enlarged except* 5, *which is much reduced.*

M.S. del, J.N. Fitch lith

Vincent Brooks, Day & Son Ltd imp

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TAB. 8563.

KOLKWITZIA AMABILIS.

China.

CAPRIFOLIACEAE. Tribe CAPRIFOLIEAE.

KOLKWITZIA, *Graebn. in Engl. Bot. Jahrb.* vol. xxix. p. 593; *Engl. & Prantl, Nat. Pflanzenfam.* vol. iv. pars 4, *Nachtr.* iii. pp. 330, 331.

Kolkwitzia amabilis, *Graebn. in Engl. Bot. Jahrb.* vol. xxix. p. 593; *Hemsl. in Gard. Chron.* 1903, vol. xxxiii. p. 81; *Stapf in Hook. Ic. Plant.* t. 2937; species unica.

Frutex copiose ramosus, ramis hornotinis molliter hirsutis, annotinis glabratis, cortice brunneo. *Folia* ovata, basi rotundata, apice acuta vel acuminata, laxe dentata vel subintegra, 3 cm. longa, 1–3 cm. lata, superne sparse, inferne ad nervos et ad margines densius hirto-pilosa vel fere villosa, nervis utrinque plerumque 3–5 tenuibus prorsus curvatis; petiolus 1–2 mm. longus. *Flores* geminati, paribus 3–9 in apice ramulorum brevium foliatorum quasi in corymbum dispositi; pedunculi filiformes, pilosi, ad 10 mm. longi; bracteae lineares vel subulatae, ad 3 mm. longae. *Receptacula* uniuscuiusque paris opposita vel unum altero altius ortum quasi ei lateraliter insertum, dense strigilloso-pilosa, superne in stipitem brevem fere solidum contracta, 3–4 mm. longa. *Sepala* linearia, acuta, saepe flexuosa, 5 mm. longa, hirta. *Corolla* oblique tubuloso-campanulata, alba roseo tincta, extra puberula, 1–1·3 cm. longa, tubo basi antice subgibboso intus antice villosulo, lobo antico quam lateralia paulo longiore. *Stamina* 4, antica ad tertiam partem, postica ad medium tubi inserta; antherae late oblongae, 1 mm. longae. *Stylus* filiformis, scaberulus, 8–9 mm. longus; stigma minute trilobum. *Ovarii* loculi 3, inaequales, unus saepe cassus; ovula 2-seriata. *Fructus* per paria connati, nucumentacei, monospermi, calyce coronati, crasse costati, costis superne saepe in cornu productis, dense strigosi, inaequales, alter minor vel subpressus. *Semen* oblongum, circiter 2 mm. longum.—O. STAPF.

The specimens on which the Caprifoliaceous genus *Kolkwitzia*, Graebn., was originally based were fruiting ones collected by the Rev. Père Giraldi near Gniu-yu, in the province of Shensi, North China. Its introduction to English gardens is due to Messrs. J. Veitch & Sons, who about 1901 received from Mr. E. H. Wilson a supply of the seeds of the solitary species, *K. amabilis*. The shrub was not seen by Mr. Wilson when in flower; his seeds were gathered near Fang, in the province of Hupeh, Central China. A plant raised from this supply flowered in the nursery of Messrs. Veitch at Coombe Wood for the first time in June 1910; another, from which the material for our plate has been obtained, blossomed there in June 1913. The genus is closely allied to *Abelia*, R. Br., but differs in having paired and usually united flowers, so that one receptacle seems to arise from the base of the other. Specimens of *K. amabilis* which have not yet flowered thrive well in loamy soil in the Kew collection, and are about four feet in height. The species appears to be quite hardy, and is found easy to propagate from cuttings made of late summer wood.

DESCRIPTION.—*Shrub*, freely branching; twigs of the first season softly hirsute, glabrous in their second season; bark brown. *Leaves* ovate, base rounded, apex acute or acuminate, margin toothed or nearly entire, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, $\frac{1}{3}$–$1\frac{1}{4}$ in. wide, sparingly hairy above, more densely hairy beneath, especially on the nerves and the margin; nerves usually 3–5 on each side the midrib, slender and curving upwards; petiole very short. *Flowers* paired; arranged in a corymbiform thyrse composed of 3–9 pairs at the apex of short leafy twigs; peduncle filiform, pilose, $\frac{1}{3}$ in. long; bracts linear or subulate, $\frac{1}{8}$ in. long. *Receptacles* of each pair of flowers opposite, or one of a pair situated somewhat above and in appearance lateral to the other, densely harshly pilose, contracted above into a short almost solid stipes, $\frac{1}{8}$–$\frac{1}{6}$ in. long. *Sepals* linear, acute, often flexuous, $\frac{1}{5}$ in. long, hairy. *Corolla* obliquely tubular-campanulate, white flushed with rose-pink, puberulous outside, about $\frac{1}{2}$ in. long, tube somewhat gibbous at the base in front, the anterior lobe of the limb rather larger than the lateral ones. *Stamens* 4, the anterior pair adnate one-third up the tube, the posterior at the middle of the tube; anthers wide-oblong. *Style* filiform, scaberulous, $\frac{1}{3}$ in. long; stigma minutely 3-lobed. *Ovary* 3-celled; cells unequal, one usually empty; ovules 2-seriate. *Fruits* connate in pairs, nutlike, 1-seeded, tipped by the calyx, stoutly ribbed, the ribs often produced above as a horn, densely strigose, unequal, one smaller or occasionally one quite suppressed. *Seed* oblong, about $\frac{1}{12}$ in. long.

Fig. 1, a pair of flowers; 2, corolla, laid open, showing staminal insertion; 3, transverse section of ovary; 4, style and stigma:—*all enlarged.*

M.S. del. J.N. Fitch lith.

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TAB. 8564.

PRIMULA VINCIFLORA.

South-western China.

PRIMULACEAE. Tribe PRIMULEAE.

PRIMULA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 631.

Primula vinciflora, *Franch. in Gard. Chron.* 1887, vol. i. p. 575, fig. 108; *Pax in Engl. Bot. Jahrb.* vol. x. p. 210; *Forbes et Hemsl. in Journ. Linn. Soc.* vol. xxvi. p. 43; *Pax et Knuth in Engl. Pflanzenr. Prim.* p. 108; *Gard. Chron.* 1906, vol. xl. p. 230, 1909, vol. xlvi. p. 344, et 1913, vol. liv. p. 198; *Forrest in Notes Roy. Bot. Gard. Edinburgh*, vol. iv. t. 30; ab affini *P. Elwesiana*, King, corollae lobis emarginatis haud denticulatis recedit.

Herba perennis, rhizoma abbreviatum. *Folia* plerumque oblonga, obtusa, usque ad 9 cm. longa et 3 cm. lata, pagina superiore pilis brevibus erectis albidis minute glanduloso-capitatis sparse tecta praetereaque aureo-glandulosa, inferiore pallidiora pilis eis superioris simillimis sed paucioribus instructa, nervis lateralibus utrinque circiter 6 obliquis intra marginem anastomosantibus supra conspicuis, margine integra vel interdum obscurius crenulata. *Scapus* uniflorus, sub anthesin in speciminibus cultis circiter 8 cm. longus, viridis nisi apice purpurascens, pilis divaricatis albis rubro-glanduloso-capitatis vel superne pilis etiam rubris tectus. *Calyx* viridis, profunde 6-lobus, segmentis lineari-oblongis obtusis 6 mm. longis et fere 2 mm. latis pilis glanduloso-capitatis dorso margineque instructis. *Corolla* violacea; tubus fere 2·5 cm. longus, extra pilis glanduloso-capitatis tectus; limbus 4·4 cm. diametro, fauce intensius violaceus, 6-lobatus, lobis angustius obcordatis ad 1·8 cm. longis et 1·4 cm. latis dorso sparse glandulosis. *Stamina* 6, glabra, apicem versus tubi inserta, tria superiora erecta, tria inferiora retrorsum directa, antheris omnibus conum post styli tergum efficientibus. *Pistillum* glabrum, stigmate parvo pallido. *Semina* (fide Franchet) compressa, alata.—*Omphalogramma vinciflora*, Franch. in Bull. Soc. Bot. Fr. vol. xlv. p. 180.—W. G. CRAIB.

The *Primula* here figured is a species which was first discovered in the province of Yunnan in South-western China by the Abbé Delavay, from whose specimens it was described by Mr. Franchet. It is one of a natural group of species which includes the Himalayan *P. Elwesiana*, King, and three other Chinese species, *P. Delavayi*, Franch., *P. Franchetii*, Pax, and *P. Engleri*, Knuth. This group differs from the rest of the genus in being characterised by large solitary flowers borne on robust scapes rising from a sheath of later developing leaves; by having the calyx divided to the base into 5–8 segments,

JULY, 1914.

and by possessing flat seeds with a wing aril. These distinctive features led Mr. Franchet to regard the group as a distinct genus for which, having regard to the seed, he proposed the name *Omphalogramma*. In *P. vinciflora* there is yet another distinguishing feature which has not been looked for so far in its consociates. This is to be found in the disposition of the stamens whereof, as Professor Bayley Balfour has pointed out, only those on the posterior side are erect, the anterior ones being bent across the corolla tube, so that all the anthers are brought together in a cone at the back of the flower. For the introduction of this species to cultivation horticulture is indebted to Messrs. Bees, Limited, for whom Mr. G. Forrest obtained its seeds in South-western China in 1908. The plant figured is one which was presented to Kew, when in flower, by Professor Balfour, with whom it blossomed in the Royal Botanic Garden, Edinburgh, in October 1913. Being doubtfully hardy it has been grown at Kew in a cool frame in which it has failed to ripen seeds, but where it is still alive and flourishing. At Edinburgh the plant flowered for the first time after five years; Professor Balfour has found it to thrive best when kept well flooded with water under ample drainage conditions. The rootstock in this species is very short, and appears to be held in the ground only by its large root fibres. In the wild plant the flowers precede the leaves; under cultivation flowers and leaves appear almost at the same time.

DESCRIPTION.—*Herb*, perennial; rootstock abbreviated. *Leaves* usually oblong, obtuse, up to 3½ in. long by 1¼ in. wide, upper surface sparingly clothed with short, erect, whitish, minutely gland-tipped hairs intermixed with golden yellow glands; the lower surface paler, with hairs like those of the upper surface but less plentiful; lateral nerves oblique, about 6 on each side the midrib, anastomosing near the margin, visible above; margin entire or sometimes obscurely crenulate. *Scape* 1-flowered, when in blossom usually about 3 in. long, sometimes longer, green with a purplish upper end, clothed with spreading hairs; whitish below, reddish above, all hairs tipped with red glands. *Calyx* green, deeply 6-lobed, segments linear-oblong, obtuse, $\frac{1}{4}$ in. long, almost $\frac{1}{12}$ in. wide, outside and along the margins clothed with gland-tipped hairs. *Corolla* violet; tube nearly 1 in. long, clothed outside with gland-tipped hairs; limb $1\frac{3}{4}$ in. across, the throat deep violet, 6-lobed, lobes narrow-obcordate, $\frac{3}{4}$ in. long, $\frac{2}{3}$ in. wide, sparingly glandular behind. *Stamens* 6, glabrous, inserted almost at the apex of the tube, the upper 3 erect, the lower 3 bent backwards so that the whole of the anthers come together in a cone behind behind the style. *Pistil* glabrous; stigma small, pale. *Seeds* compressed, winged.

Fig. 1, section of calyx, showing ovary; 2, corolla-tube laid open, showing disposition of stamens; 3 and 4, stamens; 5 pistil:—*all enlarged.*

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TAB. 8565.

TROLLIUS CHINENSIS.

North China.

RANUNCULACEAE. Tribe HELLEBOREAE.

TROLLIUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 7.

Trollius chinensis, *Bunge in Mém. Sav. Étr. Pétersb.* vol. ii. p. 77; species a *T. Ledebourii*, Reichb., cui maxime affinis, sepalis numerosioribus distinguenda.

Herba perennis. *Caulis* validus, striatus, glaber, internodiis inferioribus 17 cm. longis. *Folia* radicalia deficientia, caulina inferiora ambitu reniformia, superiora orbiculari-reniformia, usque ad 12 cm. longa et 16·5 cm. lata, palmatim 5-partita, segmentis ambitu late oblanceolatis apice acutis basi cuneatis usque ad 8 cm. longis et 5 cm. latis lobatis parte inferiore excepta acute serratis, nervis primariis et secundariis pagina superiore conspicuis inferiore prominentibus, membranaceo-chartacea, glabra, subtus pallidiora, petiolo lato ad 1 cm. longo suffulta. *Pedunculi* modo caulis striati, glabri, usque ad 28 cm. longi, paulo supra medium bracteolis duabus alternis foliosis tripartitis ornati. *Sepala* 12–13, exteriora late ovata, usque ad 2 cm. longa et 1·6 cm. lata, interiora exterioribus longiora et saepissime paulo angustiora, omnia apice rotundata, plus minusve conspicue venosa. *Petala* 20, linearia, utrinque angustata, apice acuta vel acutiuscula, 2·7 cm. longa, 2·25 mm. lata. *Stamina* glabra, filamentis usque ad 8 mm. longis, antheris apiculatis ad 3·5 mm. longis. *Carpella* glabra, stylo quam ovarium saltem dimidio breviore, ovulis biseriatis circiter 10.—W. G. CRAIB.

Among the plants from the northern provinces of China which have recently been introduced or re-introduced to European gardens by Messrs. J. Veitch & Sons through their collector, Mr. W. Purdom, one of the most interesting is the subject of our plate, to which, although it has been in cultivation for many years at Kew and elsewhere, this fresh introduction has directed more critical attention. In English gardens this species, which is a perennial that thrives vigorously and seeds freely in cultivation when grown in the bog garden or beside water under the same conditions as the Globe Flower, *Trollius europaeus*, Linn., has for many years been treated as merely a form of *T. asiaticus*, Linn., a species figured long ago at t. 235 of this work. While, however, this has been the custom in most collections, there has been a feeling among the more observant of our cultivators that this treatment was not justifiable, and that the two ought perhaps to be considered sufficiently distinct, on cultural grounds, to be recognised as separable varieties. This position, as a matter of fact, was conceded to *T. chinensis* by the late Dr. Regel when he published the short synopsis of the genus *Trollius* in which he reduced Bunge's species to *T. asiaticus*. But it should be realised that Regel's treatment, though it has been generally accepted and even extended by English botanists—since they have merged *T. chinensis* unconditionally in *T. asiaticus*—has not been uniformly adopted. On the contrary, Mr. Komarov, who is entitled from his field experience to speak with an authority as great as that of Regel or of Bunge himself, takes a very different view. Regel's primary subdivision of the genus *Trollius* is based upon the number of sepals in the flower. Under this system he is able to treat *T. chinensis* as a variety of *T. asiaticus*, while another very similar Globe Flower, *T. Ledebourii*, Reichb., falls within another group of species. Komarov, however, while agreeing with Regel that *T. asiaticus* and *T. Ledebourii* are distinct, reduces *T. chinensis* to the latter, not the former species. Finally, in the recent revision of the Eastern Asiatic species of *Trollius* by Messrs. Finet and Gagnepain, these careful and distinguished authors, while they reduce *T. Ledebourii* to *T. patulus*, Salisb., accord specific rank both to *T. asiaticus* and *T. chinensis*. Such diversity of opinion, on the part of authorities so competent as those now quoted, affords intrinsic evidence as to the difficulty there is in finding within this genus characters that may be relied upon as crucial in the delimitation of its species, and, without rendering it necessary to accept the opinion of Finet and Gagnepain as regards the position of *T. Ledebourii*, suggests the desirability of adopting their matured judgment as regards *T. chinensis*, a judgment which is in accord with the instinct of the cultivator. The original description of *T. chinensis* which Bunge has provided is, it may be remarked in passing, quite insufficient to help us in so critical a question as the position of his plant with relation to its nearest allies. Fortunately, however, it is sufficient to enable us to decide that the plant now figured is the one he had in view. It was described by him from dried flowers collected in 'Schan-ssi,' where these are used medicinally by the inhabitants. For the material for our figure, taken from Mr. Purdom's plant, we are indebted to Messrs. Veitch.

Description.—*Herb,* perennial; stem stout, striate, glabrous, the lower internodes up to 7 in. long. *Leaves:* radical obsolete; lower cauline reniform, upper orbicular-reniform in outline, up to 5 in. long and 7 in. across, palmately 5-partite, the segments wide-oblanceolate, acute with cuneate base, up to 3 in. long, 2 in. across, lobed and except in the lower portion sharply serrate, main and secondary nerves visible and raised beneath, thinly papery, glabrous, rather paler beneath; petiole broad and short, about $\frac{1}{3}$ in. long. *Peduncles* striate like the stem, glabrous, up to a foot in height, with two alternate, tripartite, leafy bracteoles above the middle. *Sepals* 12–13, the outer wide-ovate, up to $\frac{3}{4}$ in. long and $\frac{2}{3}$ in. wide, the inner rather longer and usually rather narrower than the outer, all rounded at the tip, and more or less distinctly veined. *Petals* 20, linear, narrowed to both extremities, more or less acute, over 1 in. long, about $\frac{1}{8}$ in. wide. *Stamens* glabrous; filaments up to $\frac{1}{3}$ in. long; anthers apiculate, $\frac{1}{7}$ in. long. *Carpels* glabrous; style half as long as the ovary or shorter; ovules about 10, 2-seriate.

Fig. 1, a nectary; 2 and 3, anthers; 4, carpels; 5, a carpel, in vertical section, showing ovules:—*all enlarged.*

8566

M. S. del. J. N. Fitch lith.

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TAB. 8566.

ROSA CORYMBULOSA.

China.

ROSACEAE. Tribe ROSEAE.

ROSA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 625.

Rosa (§ Cinnamomeae) **corymbulosa**, *Rolfe*; species distincta, inter affines ramulis inermibus vel parce armatis, floribus parvis numerosis et corymbulosim dispositis distinguenda.

Frutex erectus vel scandens, parce ramosus, 1–2-metralis; ramuli laeves, inermes vel interdum parce aculeati, aculeis geminatis rectis patentibus gracilibus 5–6 mm. longis basi latis, demum brunnei. *Folia* conferta, 4–9 cm. longa, 3–5-foliolata; rhachis puberula et sparse glandulosa, aculeis gracilibus paucis instructa; foliola subsessilia, ovato-oblonga, subacuta, crebre duplicato-serrata, subtus glauca vel cinereo-puberula, 1·5 cm. longa, 0·4–2 cm. lata; stipulae adnatae, anguste oblongae, acutae, 8–10 mm. longae, marginibus crebre glandulosis. *Flores* corymbulosi, numerosi, versus apices ramorum dispositi, 2–2·5 cm. diametro; pedunculi circiter 2 cm. longi, glanduloso-setulosi. *Receptaculum* ovoideo-oblongum, glanduloso-setulosum, 4 mm. longum. *Calycis* lobi ovato-oblongi, caudato-acuminati, puberuli vel subtomentosi, circiter 8 mm. longi, patentes vel reflexi. *Petala* late obcordata. *Filamenta* glabra, 2–3 mm. longa, antheris aureis. *Fructus* globosus, glandulosus, circiter 8 mm. longus, sepalis persistentibus coronatus. *Achaenia* dorso villosa, 2 mm. longa; styli villosi, in columnam 4 mm. longam cohaerentes.—R. A. ROLFE.

The distinct and striking Rose here described is perhaps most nearly allied to *R. macrophylla*, Lindl., but differs in being almost spineless when mature, and in having many small flowers which are borne in corymbs towards the ends of the branches. It was raised at Kew from seeds presented by Professor Sargent of the Arnold Arboretum, Jamaica Plain, Massachusetts, in the spring of 1908. These seeds had been collected in Western China in autumn 1907, under the field-number 630A, by Mr. E. H. Wilson. The plant from which the material for our plate has been obtained flowered at Kew for the first time in July 1913. At present this plant is a bush about six feet in height, and promises to be a fairly vigorous grower, thriving well in the rather strong loam that roses as a whole delight in. *R. corymbulosa* had previously been met with in China, for there

are specimens in the herbarium at Kew collected by Mr. A. Henry near Wushan in the province of Szechuan and at Hsingshen in the province of Hupeh.

DESCRIPTION.—*Shrub*, erect or scandent, sparingly branched, 3–6 ft. high; twigs smooth, when old brown, unarmed or at times sparingly prickly, prickles geminate, straight, spreading, slender, $\frac{1}{5}$–$\frac{1}{4}$ in. long. *Leaves* rather close-set, $1\frac{1}{2}$–$3\frac{1}{2}$ in. long, 3–5-foliolate; rachis puberulous and sparingly glandular, with a few slender prickles; leaflets subsessile, ovate-oblong, subacute, closely duplicate-serrate, beneath glaucous or grey-puberulous, $\frac{2}{3}$ in. long, $\frac{1}{6}$–$\frac{3}{4}$ in. wide; stipules adnate, narrow-oblong, acute, about $\frac{1}{3}$ in. long, their margin closely glandular. *Flowers* numerous, in small corymbs towards the ends of the branches, $\frac{3}{4}$–1 in. in diameter; peduncles about $\frac{3}{4}$ in. long, glandular-setulose. *Receptacle* ovoid-oblong, glandular-setulose, $\frac{1}{6}$ in. long. *Calyx-lobes* ovate-oblong, caudate-acuminate, puberulous or almost tomentose, about $\frac{1}{3}$ in. long, spreading or reflexed. *Petals* wide-obcordate. *Filaments* glabrous, $\frac{1}{12}$–$\frac{1}{8}$ in. long, with anthers golden-yellow. *Fruit* globose, glandular, about $\frac{1}{3}$ in. long, tipped by the persistent sepals. *Achenes* villous on the back, $\frac{1}{12}$ in. long; styles villous, conjoined in a column $\frac{1}{6}$ in. long.

Fig. 1, stipules and a proximal leaflet; 2, a flower in vertical section, the petals removed; 3 and 4, anthers; 5, an achene :—*all enlarged.*

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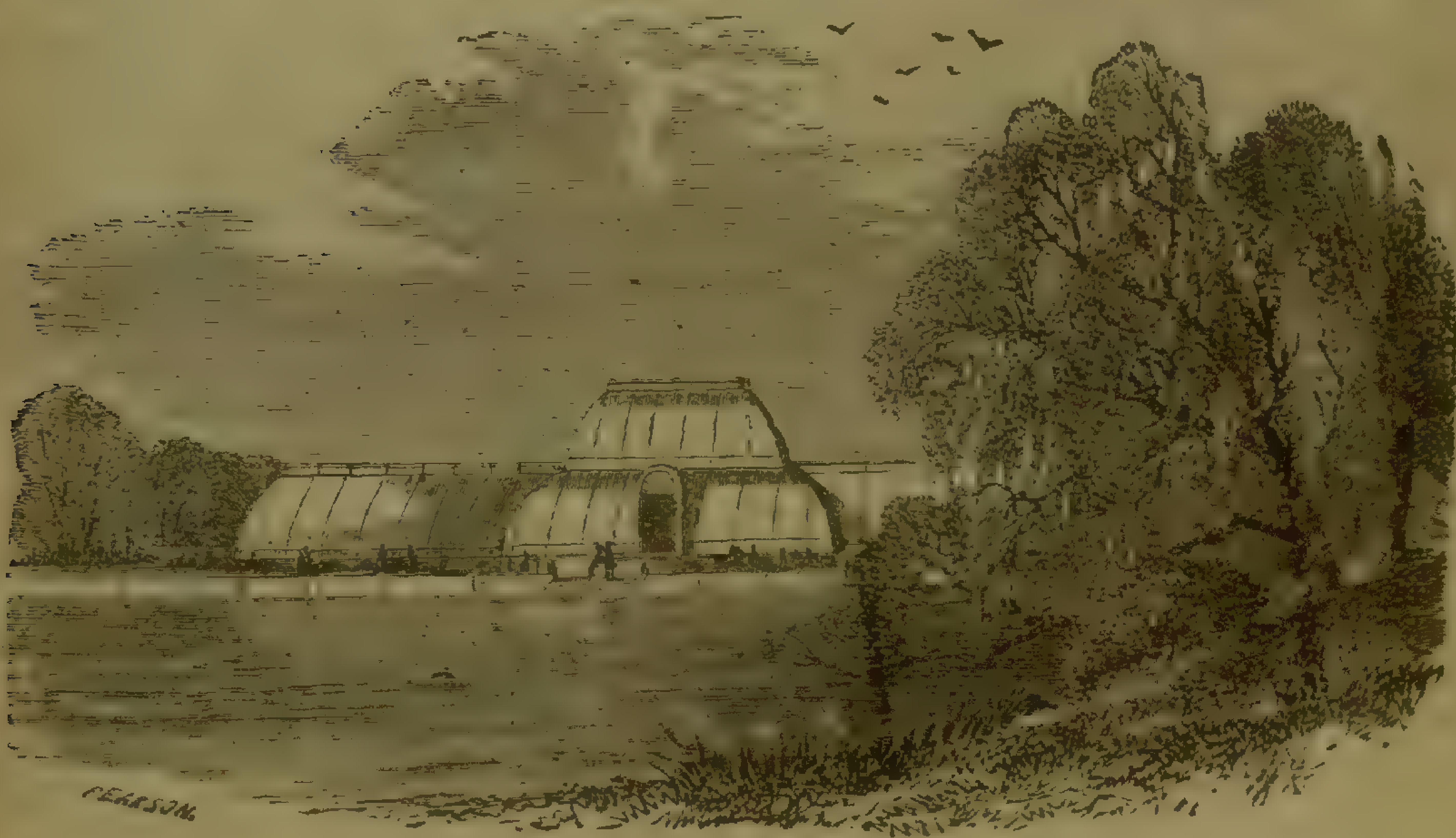

"No flower in field that dainty odour throws
And decks his branch with blossoms over all
But there was planted or grew natural."

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BOTANICAL MAGAZINE.

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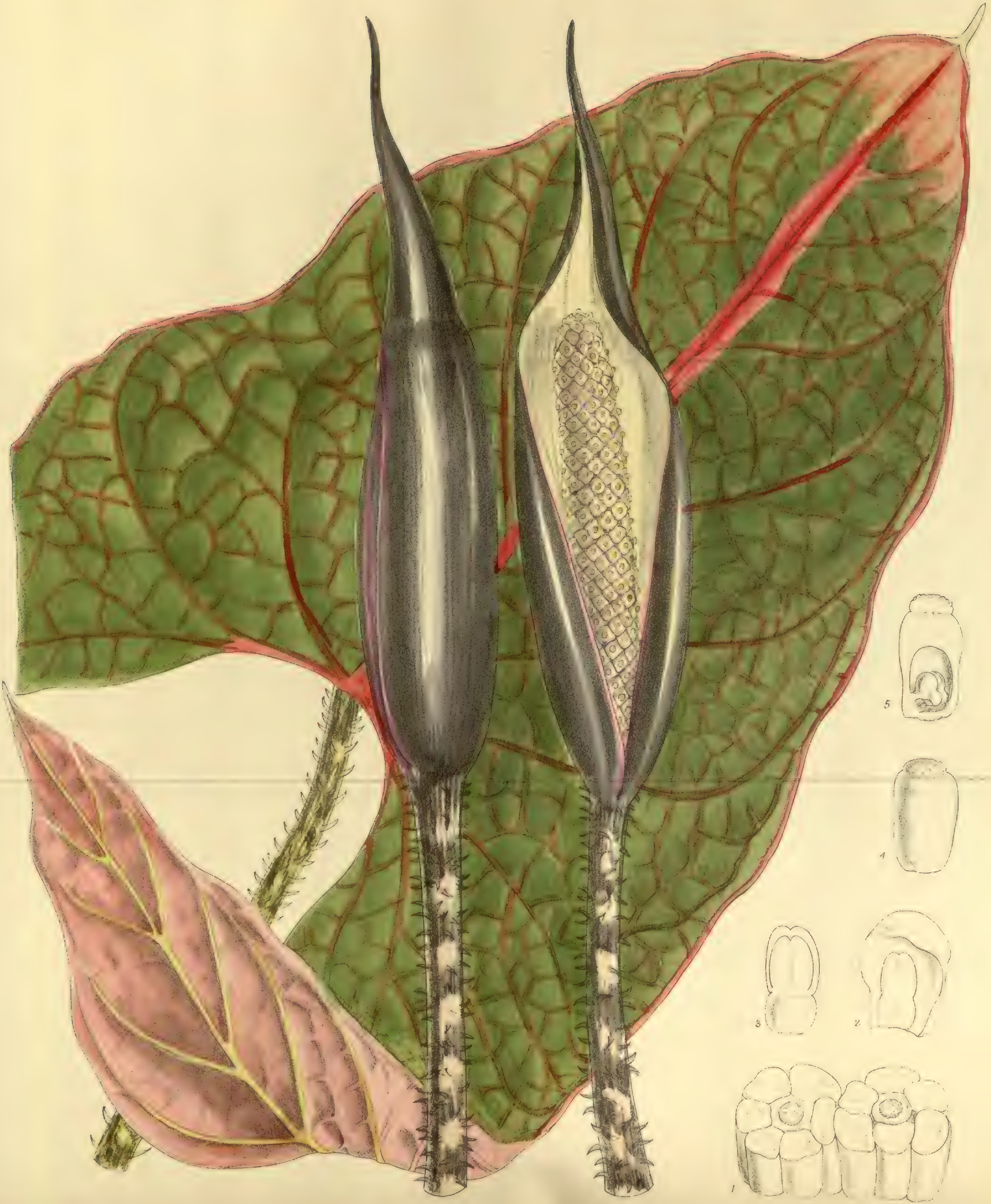

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TAB. 8567.

CYRTOSPERMA JOHNSTONI.

Solomon Islands.

AROIDEAE. Tribe ORONTIEAE.

CYRTOSPERMA, *Griff.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 997.

Cyrtosperma Johnstoni, *N. E. Br. in Gard. Chron.* 1882, vol. xviii. p. 808; *Engl. Pflanzenr.* vol. iv. 23c, p. 19; species *C. eduli*, Schott, affinis sed petiolis pedunculisque conspicue aculeatis et spatha multo minore apte distinguenda.

Herba usque ad 1 m. alta, ubique glabra. *Foliorum* petioli 0·45–1 m. longi, basi vaginati, spinis in fasciculos spiraliter dispositos armati, sordide rubro vel rubro-brunneo et atro-fusco irregulariter zonato-marmorati; laminae triangulari-sagittatae, supra virides, venis rubris, subtus sordide purpurascentes, lobo antico 18–28 cm. longo 18–30 cm. lato ad insertionem petioli, lobis posticis late divergentibus 23–36 cm. longis medio 8·5–15 cm. latis suboblique lanceolatis acuminatis, costis posticis in sinu ad 3–5 cm. denudatis. *Pedunculi* teretes, aculeati, petiolis similes. *Spatha* erecta, 15 cm. longa, 2·5 cm. lata, oblonga, longe acuminata, valde concava, marginibus incurvis, extra nigro-violacea, leviter nitida, intra sordide albo-virens leviter roseo-tincta, basi purpureo-rosea. *Spadix* brevissime nigro-stipitatus, 8·5 cm. longus, 12 mm. crassus, cylindricus, obtusus, primum virescens, demum pallide violaceus. *Sepala* et *stamina* 5–6. *Ovarium* oblongum, uniloculare, stigmate sessile coronatum; ovula 2.—*Alocasia Johnstoni*, Bull, Cat. 1878, p. 154.—N. E. BROWN.

The very ornamental Aroid here figured is a native of the Solomon Islands whence it was first introduced to European collections by the late Mr. William Bull, Chelsea. It was distributed from his establishment as *Alocasia Johnstoni*, this name first appearing in his Catalogue for the season 1878. The spiny petioles and peduncles, red-veined, arrow-shaped leaves, and blackish-violet spathes provide a combination of characters not met with in any other Aroid and impart to the species a distinction which has rendered it a favourite stove plant. It grows well in any tropical house, preferring a rich loamy soil with abundant water, except in winter when the plant is at rest. The material for our illustration has been obtained from an unusually vigorous plant, grown under the moist tropical conditions afforded in the Nepenthes House at Kew, which flowered early in August, 1913. At present *Cyrtosperma Johnstoni* appears to be the only species belonging to its genus in cultivation.

DESCRIPTION.—*Herb*, over 3 ft. high, glabrous everywhere. *Leaves* triangular-sagittate, their petioles 1½–3½ ft. long, sheathing at the base, armed throughout with spirally arranged tufts of spines, irregularly zonately marked with dull red or reddish-brown, or dark brown spots; laminae green above with red veins, dull purple underneath, the anterior lobe 7–11 in. long, 7–12 in. wide opposite the apex of the petiole, the posterior lobes widely diverging, 9–14 in. long, 3½–6 in. wide in the middle, somewhat obliquely lanceolate-acuminate, the lowest pair of lateral nerves running close to the margin for 1¼–3 in. at the base of the sinus. *Peduncles* terete and aculeate like the petioles. *Spathe* erect, 6 in. long, 1 in. across, oblong, long-acuminate, very concave, the margins incurved, outside dark violet and slightly polished, within dirty whitish-green faintly flushed with rose, at the base rosy purple. *Spadix* with a very short dark stalk, 3½ in. long, ½ in. thick, cylindric, obtuse, at first greenish, ultimately pale violet. *Sepals* 5–6. *Stamens* 5–6. *Ovary* oblong, 1-celled, tipped by the sessile stigma; ovules 2.

Fig. 1, two flowers; 2, sepal and stamen; 3, stamen, seen from behind; 4, ovary; 5, longitudinal section of an ovary, showing ovules:—*all enlarged.*

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TAB. 8568.

MECONOPSIS RUDIS.

Western China.

MECONOPSIS, *Vig.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 52; *Prantl & Kündig in Engl. & Prantl, Pflanzenfam.* vol. iii. pars 2, p. 141.

Meconopsis (§ Eumeconopsis) **rudis**, *Prain in Ann. Bot.* vol. xx. p. 347, *syn.* M. sinuata *var.* Prattii *excludend.*; species e grege Aculeatarum *M. horridulae*, Hook. f. et Thoms., proxime accedens, a qua tamen aculeis coloratis nec stramineis, floribus clare nec intense coeruleis, toro magis ampliato differt.

Herba monocarpica; caulis simplex scapiformis 3·5–7·5 dm. altus, aculeatus. *Folia* radicalia primum rosulata demum evanida; caulina alterna, utrinque aculeis simplicibus saltem basi sed saepe omnino purpureo tinctis induta, oblongo-lanceolata, margine subintegra vel parum obtuse dentata, apice obtusa vel acuta, basi in petiolum latiorem attenuata, supra pallide viridia subtus glaucescentia; lamina 8–14 cm. longa, 2·5–4 cm. lata; petioli inferiores 3–4 cm. longi, gradatim breviores. *Flores* in cymas racemiformes dispositi; pedicelli 2–6 cm. longi, aculeati, saepissime bracteati; bracteae foliis conformes sed minores sessilesque. *Sepala* 2, ovata, 1·5 cm. longa, extra parce aculeata. *Petala* 6–8, clare coerulea nonnunquam purpureo suffusa vel raro pallide purpurea, ovato-oblonga, obtusa, 2·75–4 cm. longa, 2·5–3·25 cm. lata. *Stamina* indefinita, pluri-seriata; filamenta glabra, discreta, coerulea; antherae oblongae, luteae. *Ovarium* e carpellis 4 compositum, ovoideum vel subglobosum, 6–8 mm. longum, dense aculeatum; stylus glaber, 3 mm. longus; stigma coloratum, pallide luteum. *Capsula* subglobosa vel oblonga, 1·25–1·5 cm. longa, in toro explanato incrassato 5 mm. lato insidens.—*M. racemosa*, Franch., Bull. Soc. Fr. vol. xxxiii. p. 390, et Pl. Delavay. p. 41; nec Maxim. *M. horridula*, var. *rudis*, Prain in Journ. As. Soc. Beng. vol. lxiv. pars 2, p. 314.—D. PRAIN.

The Poppywort here figured is one of the "Blue Poppies" which impart to the stony alpine tracts in South-western China at elevations of 11–16,000 feet above sea level the curious charm that their near ally *Meconopsis aculeata*, Royle, figured at t. 5456 of this work, imparts to the corresponding regions of the North-western Himalaya and Kashmir. From that well-known species the subject of our plate is, however, readily separated because of its entire or nearly entire leaves and because the flowers have always more than four petals. In colour, however, the flowers of the Western species in question and of *M. rudis*, the one now figured, agree very closely; in both species the petals are usually

AUGUST, 1914.

sky-blue but in *M. rudis*, as the figure here given shows, they sometimes have a purple tinge. It is now over a quarter of a century since the late Mr. Franchet first received specimens of this species from the late Abbé Delavay and treated them as identical with *M. racemosa*, Maxim., a plant which has, however, now been in cultivation in English rock gardens for a number of years and is readily distinguished from *M. rudis* by the darker blue of its petals and the absence of purple from its spines. The only other species with which *M. rudis* has been confounded is *M. Prattii*, originally treated as a variety of *M. sinuata*, but better kept distinct from that species on account of its having 5–8 petals in place of 4 as in *M. sinuata*. The petals in *M. Prattii* are pale blue as in *M. rudis* and in *M. aculeata*, but the foliage and the torus are as in *M. racemosa* which is itself only the usual condition assumed by the Poppywort originally described as *M. horridula*, Hook. f. & Thoms. The introduction of *M. rudis* to European gardens has been due in almost equal degree to Mr. E. H. Wilson and Mr. G. Forrest by whom it has been collected in Szechuan and in Yunnan. The plant figured is one of a large number raised from seeds collected by the first named traveller for the Arnold Arboretum and presented to Kew by Professor C. S. Sargent. The seeds were sown on a slope in the rock garden in the spring of 1911, and the plants flowered in June 1913. The species has proved hardy at Kew, but, as was anticipated when it was originally described, it has been uniformly monocarpic; all the plants that have flowered at Kew died soon after ripening their seeds.

Description.—*Herb*, monocarpic; stem 1¼–3 ft. high, simple, scapose, prickly. *Leaves* at the base rosulate but soon disappearing, those of the stem alternate, armed on both sides with simple prickles which are usually purple based, but are often straw-coloured upwards, oblong-lanceolate in outline, margin almost entire or sparingly bluntly toothed, apex obtuse or acute, narrowed below into a very wide petiole, pale green above, glaucescent beneath; leaf blade 3–5½ in. long, 1–1½ in. wide; lower petioles 1¼–1½ in. long, gradually decreasing upwards. *Flowers* arranged in raceme-like cymes; pedicels $\frac{3}{4}$–$2\frac{1}{2}$ in. long, prickly, usually bracteate; bracts like the leaves, but smaller and sessile. *Sepals* 2, ovate, $\frac{2}{3}$ in. long, sparingly prickly externally. *Petals* 6–8, bright blue, sometimes flushed with purple and occasionally pale purple throughout, ovate-oblong, obtuse, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, 1–$1\frac{1}{4}$ in. wide. *Stamens* numerous, several-seriate; filaments glabrous, free, blue; anthers oblong, yellow. *Ovary* made up of 4 carpels, ovoid or subglobose, $\frac{1}{4}$–$\frac{1}{3}$ in. long, densely prickly; style glabrous, $\frac{1}{8}$ in. long; stigma pale yellow. *Capsule* subglobose or oblong, $\frac{1}{2}$–$\frac{2}{3}$ in. long, resting on a flattened enlarged torus $\frac{1}{5}$ in. across.

Figs. 1 and 2, stamens; 3, pistil; 4, sketch of an entire plant:—*all enlarged except* 4, *which is much reduced.*

8569

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TAB. 8569.

ROSA SETIPODA.

China.

ROSACEAE. Tribe ROSEAE.

ROSA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 625.

Rosa (§ Cinnamomeae) **setipoda**, *Hemsl. et E. H. Wils. in Kew Bulletin*, 1906, p. 158; species inter affines inflorescentia permagna laxa, bracteis foliaceis et pedicellis setis longis patentissimis capitato-glandulosis instructis distincta.

Frutex 2–3 m. altus; ramuli subglabri, aculeis geminatis rectis basi late dilatatis 5–8 mm. longis armati. *Folia* 6–18 cm. longa, 7–9-foliolata, rhachis breviter glandulosa et aculeolata, foliola subsessilia, late elliptica, obtusa vel subacuta, serrata vel duplicato-serrata, supra atroviridia, subtus glauca, venis prominentibus et puberulis, 3–6 cm. longa, 1–3 cm. lata; stipulae adnatae, 1·5–2·5 cm. longae, anguste oblongae, acutae, marginibus crebre ciliato-glandulosis. *Flores* speciosi, circiter 5 cm. diametro, in cymas terminales corymbiformes laxas dispositi; pedicelli 3–5 cm. longi, glanduloso-setulosi. *Receptaculum* anguste oblongo-ovoideum, 8–10 mm. longum, copiose setuloso-glandulosum. *Calycis* lobi ovato-lanceolati, caudato-acuminati, intus pubescentes, apice foliacei et acute serrati, 2–2·5 cm. longi, patentes vel reflexi. *Petala* late obcordata, circiter 2·5 cm. lata, pallide rosea, basi albidula. *Filamenta* glabra, 3–4 mm. longa; antheris aureis. *Carpella* copiose villosa; styli 6 mm. longi, villosi. *Fructus* ovoideus, apice attenuatus, saturate ruber, circiter 2·5 cm. longus, sepalis persistentibus erectis coronatus.—R. A. ROLFE.

The striking Rose here figured was met with by Mr. E. H. Wilson in the Fang district in North-western Hupeh, Central China, at from 7000 to 9000 feet above sea-level, when collecting on behalf of Messrs. James Veitch & Sons. It was raised by that firm in 1904, and flowered for the first time in their nursery at Coombe Wood in 1909. In the interval the species was described as *R. setipoda* from herbarium material collected by Mr. Wilson, and at a still earlier date by its original discoverer, Mr. A. Henry. According to both collectors the species is not uncommon in shrubberies in Hupeh. Mr. Wilson describes it as a remarkable rose, recalling by its general facies *R. macrophylla*, Lindl. with large corymbs of handsome flowers to which a singular appearance is imparted by reason of the long pedicels clothed with spreading gland-tipped bristles, and beset with

numerous foliaceous bracts. *R. setipoda*, which appears to be quite hardy, grows vigorously in the rather stiff loam that roses as a whole enjoy. It can be propagated by cuttings made of ripened wood in autumn. The material from our plate was obtained from a bush in the Coombe Wood Nursery of Messrs. Veitch which flowered there in June and July 1913.

DESCRIPTION.—*Shrub*, 6–10 ft. high; twigs almost glabrous, armed with straight wide-based geminate prickles $\frac{1}{5}$–$\frac{1}{3}$ in. long. *Leaves* 2$\frac{1}{2}$–7 in. long, 7–9-foliolate; rachis shortly glandular and prickly; leaflets subsessile, wide elliptic, obtuse or subacute, serrate or duplicate-serrate, dark-green above, glaucous beneath, nerves prominent and puberulous, 1$\frac{1}{4}$–2$\frac{1}{2}$ in. long, $\frac{1}{3}$–1$\frac{1}{4}$ in. wide; stipules adnate, $\frac{2}{3}$–1 in. long, narrowly oblong, acute, margins closely glandular-ciliate. *Flowers* showy, about 2 in. across, arranged in loose terminal corymb-like cymes; pedicels 1$\frac{1}{4}$–2 in. long, glandular-setulose. *Receptacle* narrowly ovoid-oblong, about $\frac{1}{3}$ in. long or rather longer, copiously glandular-setulose. *Calyx-lobes* ovate-lanceolate, caudate-acuminate, pubescent within, leafy and sharply serrate at the tip, $\frac{3}{4}$–1 in. long, spreading or reflexed. *Petals* wide obcordate, about 1 in. across, pale rose with whitish base. *Stamens* with glabrous filaments about $\frac{1}{6}$ in. long; anthers golden. *Carpels* rather densely villous; styles $\frac{1}{4}$ in. long, villous. *Fruit* ovoid, narrowed to the apex, deep red, about 1 in. long, tipped by the erect persistent calyx-lobes.

Fig. 1, vertical section of a flower, the petals removed; 2 and 3, anthers; 4, carpel and style:—*all enlarged.*

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TAB. 8570.

ZINGIBER MIOGA.

Japan.

SCITAMINEAE. Tribe ZINGIBEREAE.

ZINGIBER, *Adans.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 646.

Zingiber Mioga, *Roscoe in Trans. Linn. Soc.* vol. viii. (1807) p. 348; *Franch. et Savat. Enum. Pl. Japon.* vol. ii. (1879) p. 20; *Schumann in Engl. Pflanzenr.* vol. iv. 46, p. 183 (1904); *Ito, Ic. Pl. Jap.* vol. i. No. 1, t. 4; species *Z. atro-rubente*, Gagnepain, affinis, sed spica breviore, calyce longiore, labello obovato distinguitur.

Herba perennis. *Rhizoma* horizontale, circiter 6 mm. diametro. *Culmi* erecti, usque ad 8 dm. alti, glabri, foliorum vaginis longitudinaliter striatis glabris obtecti. *Folia* lineari-lanceolata, apice attenuato-acuminata, basi attenuata, usque ad 2·6 dm. longa et 4 cm. lata, nervis lateralibus plurimis parallelis cum costa pagina utraque subprominentibus, glabra vel pagina inferiore basin versus sparse pilosa, membranacea, cum petiolo 1·5 mm. longo instructa; ligula 4–7 mm. longa, 4–6 mm. lata, conspicue biloba, lobis apice subacutis vel obtusis, glabra, membranacea. *Spica* ellipsoidea, circiter 6 cm. longa, 3·5 cm. lata; pedunculus circiter 2 cm. longus, squamis ovato-oblongis vel oblongis acutis obtectus; bracteae exteriores ovato-ellipticae, subacutae, 2·5 cm. longae, 1·8 cm. latae, glabrae. *Calyx* tubulosus, spathaceo-fissus, fere truncatus, usque ad 2·8 cm. longus, membranaceus. *Corolla* flava, tubo anguste infundibuliformi fere 4 cm. longo basi 2 mm. apice 1 cm. diametro, lobis acuminatis, 2 anticis oblongo-lanceolatis 3 cm. longis 0·9 cm. latis, postico ovato-lanceolato 3·2 cm. longo 1·3 cm. lato. *Labellum* obovatum, integrum, 3 cm. longum, 2·1 cm. latum, basi lobis binis brevibus instructum, flavum. *Staminodia* interiora filiformia, 5·5 mm. longa. *Anthera*, appendicula incurva 1 cm. longa exclusa, 1·5 cm. longa. *Ovarium* pubescens, breviter cylindricum, 6 mm. altum, 2·5 mm. diametro.—*Amomum Mioga*, Thunb. Fl. Jap. (1784) p. 14; Banks, Icon. Kaempf. t. 1.—W. B. TURRILL.

The pleasing Gingerwort which forms the subject of our illustration is one which has been known to European botanists almost as long as the West has had intercourse with Japan, and has been grown at intervals in European conservatories for more than a century. It is said to occur in a wild state in woods and bamboo-groves in the warmer parts of Hondō, Shikoku and Kyūshū as well as in the islands of Tsu-shima in Japan. It is, however, more frequently met with as a cultivated plant in Japanese gardens. The plant from which the material for our plate was obtained is one imported from Japan by Mr. H. J. Elwes and presented by him to the Kew collection in 1912. Grown in a warm house under the conditions suited to various species of *Zingiber* and *Amomum*, *Z. Mioga* has thriven well; it flowered freely in September 1913. The specific name 'Mioga' is adapted from the Japanese vernacular name for the plant, which in its native country is much esteemed for its aromatic qualities. The young inflorescences, also the young leafy shoots, are used for flavouring soups and pickles, and also as a spice.

DESCRIPTION.—*Herb*, perennial; rootstock horizontal, about $\frac{1}{4}$ in. thick; leafy stems erect up to $2\frac{1}{2}$ ft. in height, glabrous, covered with longitudinally striate leaf-sheaths. *Leaves* linear-lanceolate, narrowly acuminate at the tip, narrowed to the base, up to 10 in. long, about $1\frac{1}{2}$ in. wide, with many parallel lateral nerves which are distinct on both faces as is the midrib, membranous, glabrous on both sides or with the under surface sparingly hairy near the base; petiole very short; ligule $\frac{1}{6}$–$\frac{1}{4}$ in. long, nearly as wide, distinctly 2-lobed, lobes subacute or rounded, membranous, glabrous. *Spike* ellipsoid, about $2\frac{1}{2}$ in. long, $1\frac{1}{2}$ in. across; peduncle about $\frac{3}{4}$ in. long, clothed with ovate-oblong or oblong acute scales; outer bracts ovate-elliptic, subacute, 1 in. long, $\frac{2}{3}$ in. wide, glabrous. *Calyx* tubular, spathaceously split, almost truncate, over 1 in. long, membranous. *Corolla* yellow, tube narrowly funnel-shaped, about $1\frac{1}{2}$ in. long, $\frac{1}{10}$ in. wide at the base, $\frac{1}{5}$ in. wide at the top, lobes acuminate, the two anterior oblong-lanceolate, $1\frac{1}{4}$ in. long, $\frac{1}{3}$ in. wide, the posterior ovate-lanceolate, $\frac{1}{3}$ in. long, $\frac{1}{2}$ in. wide. *Lip* obovate, entire, $1\frac{1}{4}$ in. long, $\frac{7}{8}$ in. wide, with two short basal lobes, yellow. *Staminodes* filiform, under $\frac{1}{4}$ in. long. *Anther* nearly $\frac{2}{3}$ in. long, with a long incurved appendage over $\frac{1}{3}$ in. long. *Ovary* pubescent, shortly cylindric, $\frac{1}{4}$ in. long, $\frac{1}{10}$ in. wide.

Fig. 1, calyx and ovary; 2, the same, calyx laid open; 3, anther and style:—*all enlarged.*

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TAB. 8571.

COTONEASTER FRANCHETII.

Western China.

ROSACEAE. Tribe POMEAE.

COTONEASTER, *Medik*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 627.

Cotoneaster Franchetii, *Bois in Rev. Hort.* 1902, p. 379, figs. 159, 160, 161, 164; 1907, p. 256 cum icon. fig. 1 et p. 257, fig. 90; *Vilmorin et Bois, Frut. Vilmorin.* p. 117 cum icon.; *Rehder et Wils. in Sargent, Pl. Wilson.* p. 165; species *C. pannosae*, Franch., affinis foliis paulo majoribus petalis erectis roseo-tinctis fructibus oblongis aurantiaco-rubris differt.

Frutex 1–3-metralis, ramis albo-pannosis, deinde glabrescentibus cortice atro-fusco tectis. *Folia* ovata vel ovato-elliptica, basi acuta vel subacuta, apice acuta vel breviter acuminata, mucronulata, 2–3 cm. longa, 1–1·6 cm. lata, supra saturate viridia pilisque tenuissimis longis conspersa, subtus albo-pannosa, nervis lateralibus obliquis utrinque circiter 4 supra impressis infra prominentibus; petiolus 3 mm. longus, tomentosus; stipulae subulatae, ad 3 mm. longae, rubescentes, pilosae. *Inflorescentiae* corymbosae, ramulos foliatos 1·5–4 cm. longos interdum ramulo subcorymbo orto prolongatos terminantes, 15–25-florae, 1·5–2 cm. latae, densiusculae, griseo-tomentosae; bracteae filiformes; pedicelli brevissimi vel ad 3 mm. longi. *Receptaculum* sub anthesi turbinatum, laxe griseo-tomentosum, 2·5 mm. diametro. *Calycis* dentes triangulari-ovati, apiculati, eodem indumento ac receptaculum induti. *Petala* rotundata, 3 mm. diametro, amoene roseo-tincta, sub anthesi erecta. *Stamina* circiter 20. *Styli* 2–3; carpella 2–3 in vertice villosa. *Fructus* aurantiaco-rubri, oblongo-ellipsoidei vel turbinato-oblongi, circiter 1 cm. longi, 6–7 mm. diametro.—O. STAPF.

The striking *Cotoneaster* which is here figured first became known in European collections through plants raised by Mr. M. L. de Vilmorin in his garden at Les Barres from seeds communicated to him by his correspondent the Abbé Soulié. Where the Abbé collected these seeds is not exactly known, but the plant has since been met with by Mr. E. H. Wilson in various localities in Western Szechuan at altitudes of from 6500–9500 feet above sea-level. According to Mr. Bois the species also extends into Yunnan in which province it was collected by the Abbé Delavay at Hee-chan-men at an altitude of 8500 feet. *C. Franchetii* is a very graceful shrub which reaches a height of eight to ten feet, its branches arching and elegant. The plant from which the material for our plate has been obtained is one which was presented to Kew by Mr. M. L. de Vilmorin in 1901. It bears fruit freely every year, and is very handsome in autumn, but its flowers, which appear in June, are too fugacious to add much to the attractiveness of the species. It is very hardy, grows freely in soil of even moderate quality, and is easily increased by cuttings made of firm twigs about the end of July.

DESCRIPTION.—*Shrub*, 3–10 ft. high, branches white felted at length glabrescent, bark dark brown. *Leaves* ovate or ovate-elliptic, base acute or subacute, apex acute or shortly acuminate, mucronulate, $\frac{3}{4}$–$1\frac{1}{4}$ in. long, $\frac{1}{3}$–$\frac{2}{3}$ in. wide, dark green and sparingly beset with long slender hairs above, white felted beneath, lateral nerves oblique, about 4 on each side of the midrib, sunk above, raised beneath; petiole $\frac{1}{8}$ in. long, tomentose; stipules subulate, reddish, pilose, up to $\frac{1}{8}$ in. long. *Inflorescences* corymbose, terminal on leafy twigs $\frac{2}{3}$–$1\frac{1}{2}$ in. long which are at times continued by a twig springing from below the inflorescence; corymbs 15–25-flowered, $\frac{2}{3}$–$\frac{3}{4}$ in. across, rather compact, grey-tomentose; bracts filiform; pedicels very short, or occasionally up to $\frac{1}{8}$ in. long. *Receptacle* turbinate when in flower, loosely grey-tomentose, $\frac{1}{10}$ in. across. *Calyx-teeth* triangular-ovate, apiculate, clothed with the same tomentum as the receptacle. *Petals* rounded, $\frac{1}{8}$ in. across, tinged with rose, in flower erect. *Stamens* about 20. *Styles* 2–3, the carpels villous at the top. *Fruit* orange-red, oblong-ellipsoid or turbinate oblong, over $\frac{1}{3}$ in. long, about $\frac{1}{4}$ in. across.

Fig. 1, apical portion of a leaf; 2, a flower; 3, vertical section of a flower, the petals removed; 4 and 5, anthers; 6, a pyrene:—*all enlarged.*

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BOTANICAL MAGAZINE.

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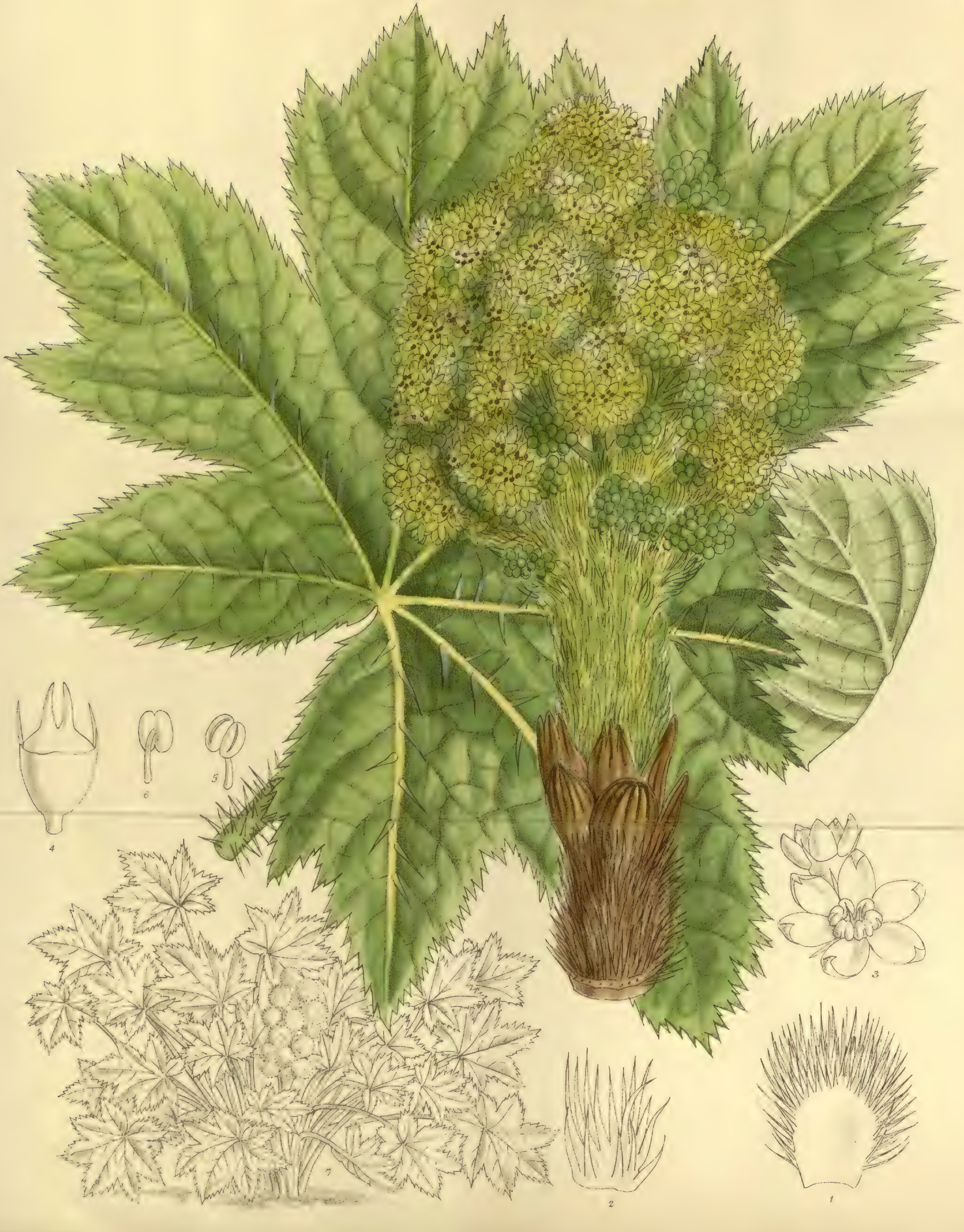

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Tab. 8572.

ECHINOPANAX horridus.

Japan and North America.

Araliaceae. Tribe Schefflereae.

Echinopanax, *Dcne et Planch.; Harms in Engl. & Prantl, Nat. Pflanzenfam.* vol. iii. pars 8, p. 34.

Echinopanax horridus, *Dcne et Planch. ex Macoun Cat. Canad. Pl.* vol. i. p. 189; *Harms in Engl. & Prantl, Nat. Pflanzenfam.* vol. iii. pars 8, p. 34; *Nakai in Journ. Coll. Sci. Tokyo*, vol. xxvi. p. 276; species unica.

Frutex 1–3-metralis. *Caulis* aculeis plurimis armatus, basi repens, apice foliatus. *Folia* petiolata, palmatifido-palmata, 5–9-loba, 15–25 cm. diametro, lobulis pinnatifidis et irregulariter dentatis, venis aculeatis; petioli 8–20 cm. longi, aculeati. *Flores* umbellati; umbellae globosae, in racemos vel paniculas compactas dispositae, rhachi aculeata et dense villosa; bracteae suborbiculares, fimbriatae, deciduae. *Flores* breviter pedicellati, pallide virides. *Calycis* lobi 2 spinescentibus exceptis brevissimi. *Petala* 5–6, valvata, ovata vel ovato-oblonga, 3 mm. longa, apice acuta et incurva. *Filamenta* glabra, 3–4 mm. longa; antherae oblongae, 1·5 mm. longae. *Styli* 2, distincti, 1·5 mm. longi, apice divergentes. *Fructus* obovoideus, sulcatus, subcompressus, 5–6 mm. longus, coccineus, stylis persistentibus coronatus; pedicelli 7–8 mm. longi.—*Echinopanax* sp., Dcne et Planch. in Rev. Hort. 1854, p. 105. *Panax horrida*, Smith in Rees Cyclop. vol. xxvi. n. 10; DC. Prodr. vol. iv. p. 252; Hook. Fl. Bor. Amer. vol. i. p. 273, t. 98; Bongard Veg. Sitka, p. 25; Torr. & Gray, Fl. N. Amer. vol. i. p. 648. *Aralia erinacea*, Hook. in Edinb. Journ. Sci. vol. vi. p. 64; DC. Prodr. vol. iv. p. 259. *Oplopanax horridus*, Miq. Ann. Mus. Lugd.-Bat. vol. i. p. 16; Franch. et Sav. Enum. Pl. Jap. vol. i. p. 194. *Fatsia* sp., Benth. et Hook. f. Gen. Plant. vol. i. p. 939. *F. horrida*, S. Watson, Bot. Calif. vol. i. p. 273; Macoun Cat. Canad. Pl. vol. i. p. 189; Coult. Man. Bot. Rocky Mt. Reg. p. 122.—R. A. Rolfe.

The striking Araliad which is here figured is a plant as to whose classification there has been no little difference of opinion. Originally described by Smith as *Panax horrida*, it was soon afterwards described again by the elder Hooker as *Aralia erinacea*. In their *Flora* Torrey and Grey recognised the identity of Hooker's species with that of Smith, whom they followed in treating it as a *Panax*, but as the type within that genus of a distinct section *Oplopanax*, which Miquel subsequently treated as a distinct genus. In this conclusion, however, Miquel had been anticipated by Decaisne and Planchon, who proposed for the genus the name *Echinopanax*. The

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elder Hooker included in the genus *Aralia* the Rice-paper Plant of Japan, figured at t. 4897 of this work as *A. papyrifera*, Hook., and in the *Genera Plantarum* Bentham and Hooker have followed the elder Hooker in treating these two as congeneric, admitting, however, that they cannot be treated as species of *Aralia*. In 1859, however, C. Koch had come to the conclusion that *Aralia papyrifera* is also entitled to be considered a distinct genus to which he gave the name *Tetrapanax*. The genus to which Bentham and Hooker have referred the species whereon the genera *Echinopanax* and *Tetrapanax* were based is *Fatsia*. But, in his careful revision of the *Araliaceae*, Dr. Harms has advanced reasons for considering that both *Tetrapanax* and *Echinopanax* are quite distinct from *Fatsia*, a conclusion with which, after further study of the group, Mr. Rolfe finds himself in accord. *Echinopanax horridus* is a native of the coast and islands of North-west America, from Sitka and the Charlotte Sound to the Oregon, the borders of California and the Rocky Mountains. The species occurs again in Japan, where it is known as Ari Bouki. A figure is given in the thirtieth volume of the standard Japanese work, Phonzo Zoufou, at folio 12, recto. Nakai has recently announced the existence of an *Echinopanax* in Corea, which he has described as *E. elatus*, and as differing from *E. horridus* in having umbellate in place of racemose umbellules. Although *E. horridus* is very hardy, in so far as being capable of enduring severe cold is concerned, it has never been a success in the open ground at Kew owing to its habit of starting early into growth in spring under the stimulus of what, to it, is unseasonable warmth. This early growth is almost always destroyed by subsequent frost. The plant from which our plate was prepared was purchased from the nursery of the Messrs. Lemoine in 1909. Since then it has been planted in the open ground, but covered by a glass frame through the early spring months. Under this treatment, which affords sufficient protection to its young leaves, it has made a healthy plant, striking for its fine foliage and formidable armature. In the coast forests of North-west America the entangled prickly stems are described as a serious impediment to travel.

In the hemlock spruce forests of Japan it has been found by Professor Sargent growing freely in dense shade, a circumstance which suggests that the species might make a pleasing feature in damp shady spots in localities where the difficulty in regard to spring frosts need not be dreaded.

DESCRIPTION.—*Shrub*, 3–10 ft. high. *Stem* closely armed with prickles, creeping below, leafy at the top. *Leaves* petioled, palmately 5–9-lobed, 6–10 in. across, lobules pinnatifid and irregularly toothed, nerves prickly ; petiole 3–8 in. long, prickly. *Flowers* umbellate ; umbels globose, arranged in dense racemes or panicles ; rachis prickly and densely hairy ; bracts suborbicular, fimbriate, deciduous. *Flowers* shortly pedicelled, pale green. *Calyx* small, 2 lobes spinescent, the others very short. *Petals* 5–6, valvate, ovate or ovate-oblong, $\frac{1}{8}$ in. long, acute and incurved at the tip. *Filaments* glabrous, $\frac{1}{8}$–$\frac{1}{6}$ in. long ; anthers oblong, $\frac{1}{16}$ in. long. *Styles* 2, free, diverging, $\frac{1}{16}$ in. long. *Fruit* obovoid, sulcate, somewhat compressed, $\frac{1}{5}$–$\frac{1}{4}$ in. long, pink, tipped by the persisting styles ; fruiting pedicels $\frac{1}{3}$ in. long.

Fig. 1, a bract ; 2, portion of a bract ; 3, flowers ; 4, calyx ; 5 and 6, stamens ; 7, sketch of an entire plant :—*all enlarged except* 7, *which is much reduced.*

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TAB. 8573.

HAMAMELIS VERNALIS.

South-eastern United States.

HAMAMELIDACEAE.

HAMAMELIS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 667.

Hamamelis vernalis, *Sargent in Trees & Shrubs*, vol. ii. p. 137, t. 156; species *H. virginianae*, Linn., proxima sed praecox et stolonifera.

Frutex deciduus, 1·5–2-metralis, stolonifer; ramuli brunnei primum indumento stellato induti, demum glabrati. *Folia* obovata vel elliptica, irregulariter grosse crenata, apice obtusa vel acuta, basi cuneata vel oblique truncata, supra glabra vel secus nervos stellato-tomentosa, subtus saepissime subglaucescentia et densius secus nervos tomentosa; 5–10 cm. longa, 2·5–7·5 cm. lata; petiolus stellato-pilosus, 1–1·5 cm. longus. *Flores* in glomerulos axillares aggregati; glomeruli 3–4-flori, pedunculis 6 mm. longis fusco-tomentosis suffulti. *Calyx* 4-lobus; lobi 3 mm. longi, rotundato-ovati, ciliati, intus rubri, extra pubescentes. *Petala* 4, lutea, 1·2 cm. longa, margine sinuata. *Capsula* 2-valvis, 1·2 cm. longa; valvae lignosae. *Semina* fusca vel fere atra.—W. J. BEAN.

The Witch-hazel here described and figured is of great interest in that, although it is a native of North America, it resembles the Japanese species, *Hamamelis japonica*, Sieb. & Zucc., in flowering from midwinter to spring. Its nearest ally is, however, the North American *H. virginiana*, Linn., which differs in coming into flower in autumn whilst still in full leaf. There are several other points which distinguish *H. vernalis*, now figured, from *H. virginiana*; *H. vernalis* has the calyx-lobes red on the inner face, has a more abundant and more persistent pubescence on the foliage and twigs, and has dull in place of glossy leaves, which are rather glaucous beneath. A still more striking difference is the habit of spreading by stolons, which causes a single plant of *H. vernalis* to become in time the centre of a thicket. *H. vernalis* was introduced to Kew from the Arnold Arboretum in 1909, two years before its claim to be considered a distinct species was established by Professor Sargent. It was, however, first discovered by Engelmann, on the banks of the Upper Maramea River in Missouri in 1845, and has since then been met with in Arkansas and Louisiana.

It has perhaps been scarcely long enough in cultivation for its full value as a garden shrub to be shown, but as yet it has hardly established a claim to equal in beauty the Japanese and Chinese species which form so charming a feature during the opening months of the year, for it has not flowered so abundantly as they habitually do, nor are the petals in the American plant of so bright a yellow. It thrives vigorously in loamy soil, and up to the present has been propagated by grafting on *H. virginiana.*

DESCRIPTION.—Shrub, up to 6 ft. high, deciduous, spreading by means of stolons; twigs brown, clothed at first with a brown stellate pubescence which partially persists over the winter. *Leaves* obovate to elliptic, irregularly coarsely crenate, apex blunt or acute, base cuneate to obliquely truncate; glabrous above or with stellate hairs on the nerves; beneath usually slightly glaucous, the nerves more closely stellate hairy, especially when young; 2–4 in. long, 1–3 in. wide; petiole stellate-hairy, $\frac{3}{8}$–$\frac{5}{8}$ in. long. *Flowers* in axillary clusters of 3–4, opening during December and January, on stout curved peduncles $\frac{1}{4}$ in. long, which are clothed with a reddish-brown pubescence. *Calyx* 4-lobed; lobes roundish or ovate, $\frac{1}{8}$ in. long, dark-red within, margin ciliate, outside pubescent. *Petals* 4, yellow, $\frac{1}{2}$ in. long, bent and wavy. *Fruit* a woody, 2-valved capsule, $\frac{1}{2}$ in. long. *Seeds* dark-brown or almost black.

Fig. 1, a leaf-bud; 2, a flower; 3, the same, petals removed; 4 and 5, anthers; 6. staminodes; 7, vertical section of an ovary:—*all enlarged.*

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TAB. 8574.

PIMELEA FERRUGINEA.

West Australia.

THYMELAEACEAE. Tribe EUTHYMELAEEAE.

PIMELEA, *Banks*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 189.

Pimelea ferruginea, *Labill. Pl. Nov. Holl.* vol. i. p. 10, t. 5; *Benth. Fl. Austral.* vol. vi. p. 10; species *P. roseae*, R. Br., affinis sed foliis latioribus brevioribus apice subobtusis vel leviter mucronatis recedit.

Frutex erectus, ramosus, usque ad 4–6 dm. altus, ramis glabris. *Folia* opposita et decussata, obovato- vel elliptico-oblonga vel oblongo-oblanceolata, apice subobtusa vel leviter mucronata, basi leviter angustata, circiter 1·1 cm. longa et 4 mm. lata, sessilia, margine plus minusve recurva, costa pagina superiore obscura inferiore subprominente, nervis lateralibus pagina utraque obscuris. *Capitula* terminalia, globularia, multiflora; involucri bracteae 4, suborbiculares, apice acutae, 1 cm. longae, 7 mm. latae, membranaceae, coloratae, glabrae. *Perianthii* tubus cylindricus, 1·1 cm. longus, 1·25 mm. diametro, superne leviter dilatatus, extra pilis numerosis inferne longis patentibus superne brevioribus adpressis obtectus, intus glaber; lobi 4, oblongi, apice rotundati, 3·5 mm. longi, 2·25 mm. lati, extra longe et adpresse pubescentes, intus glabri. *Stamina* 2, filamentis 4 mm. longis, antheris 1 mm. longis. *Discus* hypogynus, e lobis 4 minutissimis per paria connatis vel approximatis paribus perianthii lobis duobus interioribus oppositis constitutus. *Ovarium* oblongo-cylindricum, apice rotundatum, 1·5 mm. altum, 0·75 mm. diametro, glabrum; stylus lateralis, 1·2 cm. longus, glaber.—*P. decussata*, R. Br. Prod. p. 360; Meissn. in Pl. Preiss. vol. i. p. 602, vol. ii. p. 270, et in DC. Prod. vol. xiv. p. 502; Sweet, Fl. Austral. t. 8; Lodd. Bot. Cab. t. 1283; Maund, Botanist, t. 136. *P. diosmifolia*, Lodd. Bot. Cab. t. 1708. *Heterolaena decussata*, C. A. Mey. in Bull. Acad. Petrop. vol. iv. p. 73.—W. B. TURRILL.

The *Pimelea* which forms the subject of our plate is an old garden plant more familiar in collections in the days when cultivators were emulous in the successful treatment of hard-wooded species than it appears to be now. It is a native of West Australia, in the southern parts of which colony it is widely distributed. Like many other widely spread species, *P. ferruginea* varies somewhat in the colour of its flowers. In the plant which was the basis of our figure these are bright pink, but from the various coloured figures of the species which have been published we learn that the flowers may vary from a pale pink to a fairly deep red. The bracts subtending the heads of flowers are of a greenish-pink hue. The spreading white hairs on the lower part of the perianth-tube impart a very distinctive appearance to the inflorescence. In the flowers of the genus *Pimelea* it has been said that there are no hypogynous scales such as occur in other Thymelaeaceous genera like *Daphne* and *Lasiadenia*. This statement does not, however, hold universally, for in the species now described the scales, though very small, are nevertheless present in connate or approximate pairs at the base of the ovary and opposite the inner perianth segments. The cultural conditions most suitable for *P. ferruginea* are those required by Cape Heaths. At Kew it thrives well in a cool sunny greenhouse, where it flowers freely in spring.

DESCRIPTION.—*Shrub*; stems erect, branched, $1\frac{1}{2}$–2 ft. high; branches glabrous. *Leaves* opposite, decussate, obovate-oblong or elliptic-oblong, or oblong-oblanceolate, somewhat blunt at the tip or slightly mucronate, rather narrowed towards the base, under $\frac{1}{2}$ in. long, about $\frac{1}{6}$ in. wide, sessile, margin more or less recurved, midrib hardly visible above, somewhat raised beneath, lateral nerves hardly visible on either face. *Heads* terminal, globose, many-flowered; involucral bracts 4, suborbicular, acute, $\frac{1}{3}$ in. long, $\frac{1}{4}$ in. wide, membranous, glabrous, greenish-pink. *Perianth* hypocrateriform; tube cylindric, under $\frac{1}{2}$ in. long, $\frac{1}{20}$ in. wide, slightly dilated upwards, densely clothed outside with white hairs long and spreading below, shorter and adpressed above, glabrous within; lobes 4, oblong, rounded at the tip, $\frac{1}{7}$ in. long, $\frac{1}{10}$ in. wide, adpressed pubescent outside, glabrous within. *Stamens* 2; filaments $\frac{1}{6}$ in. long; anthers very short. *Disk* hypogynous, composed of 4 minute lobes, connate or approximate in pairs, opposite the two inner perianth lobes. *Ovary* oblong-cylindric, rounded at the tip, glabrous; style lateral, $\frac{1}{2}$ in. long, glabrous.

Fig. 1, a flower; 2 and 3, anthers; 4, pistil:—*all enlarged.*

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TAB. 8575.

ACONITUM ROTUNDIFOLIUM.

Western Central Asia.

RANUNCULACEAE. Tribe HELLEBOREAE.

ACONITUM, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 9.

Aconitum rotundifolium, *Kar. et Kir. in Bull. Soc. Imp. Nat. Mosc.* vol. xv. (1842), p. 139; *Led. Fl. Ross.* vol. i. p. 740. *Regel in Pl. Radd.* vol. i. p. 115, t. iii. fig. w, *et in Gartenflora*, vol. xxx. (1881), p. 357, t. 1063, fig. 2; *Stapf in Ann. Roy. Bot. Gard. Calcutta*, vol. x. pars ii. p. 149, t. 99; inter species sectionis *Napelli* tuberum cambio discontinuo in cylindra tenuia plerumque 4 sparsa dissoluto distinctum, colore florum mire variegato et nectarii cuculla antice admodum decurva insigne.

Herba 15–40 cm. alta. *Tubera* geminata; annotinum obconicum vel subcylindricum, 1–2·5 cm. longum, 6–8 mm. diametro, fibris longis munitum, in sectione transversa niveum, cortice tenui albido-fusca, cambio in cylindra tenuia 4–5 sparsa dissoluto; hornotinum nigrescens. *Caulis* erectus vel ascendens, teres, crispo-pubescens vel pilis subpatulis superne villosulus, inferne glabrescens. *Folia* nonnulla basalia in rosellam disposita, longiuscule petiolata, in speciminibus spontaneis cum floribus coetanea, in cultis a me visis sub anthesi emarcida, nonnulla in caule aequaliter sparsa, petiolis sursum cito decrescentibus; lamina ambitu orbiculari-cordata vel subreniformis, sinu angusto, e sinu ad apicem 1–3·5 cm. alta, 2–6 cm. lata, ad $\frac{4}{5}$ 5–7-palmati-partita, divisionibus late obovato-cuneatis, 3- vel exterioribus 2-lobis, lobis parce crenatis vel inciso-crenatis, crenis subobtusis vel interdum breviter acutis, foliorum superiorum minus divisa, lobis crenisque angustioribus, omnium glabra vel saepius magis minusve crispule pubescens. *Inflorescentia* ubique pubescens vel villosula e racemis in paniculam angustam collectis composita vel saepius racemum solitarium referens, racemi pauciflori; bracteae inferiores 5–3-partitae, segmentis angustis, superiores indivisae; bracteolae 2, lineari-lanceolatae vel lineares vel obsoletae; pedicelli ad 2 cm. longi, suberecti. *Sepala* ex albido et viridi variegata, violaceo-venosa et saepe hinc inde purpureo- vel violaceo-suffusa, summum naviculare, magis minusve rostratum apice subacutum, circiter 18 mm. altum, pubescens; lateralia late oblique obovata vel rotundata, circiter 15 mm. longa; inferiora late oblonga, obtusa, 6–8 mm. longa. *Nectaria* ungue glabro vel raro inferne piloso 15–16 mm. longo, cuculla antice admodum decurva vel horizontali apice inflata, labio bifido cucullam aequante vel paulo longiore. *Filamenta* basi latiuscula, superne tenuiter attenuata, dentata vel edentata, glabra, raro pilosa. *Carpella* 5, sub anthesi arcte conniventia, oblonga, abrupte in stylum contracta, albo-pilosa, plerumque pilis patulis niveis conspicuis, raro subglabra. *Folliculi* oblongi, truncati, contigui, 9–13 mm. longi, plerumque pilosi. *Semina* obpyramidata, 3-angularia, 2·5–3 mm. longa, angulis inaequaliter alatis.—*A. thianschanicum*, Rupr. Sert. Thiansch. p. 38. *A. oliganthemum*, A. Kern. in Ber. Naturw. Ver. Innsbruck, vol. i. (1870), p. 119. *A. Napellus* var. *rotundifolium*, Hook. f. et Thoms. in Hook. f. Fl. Brit. Ind. vol. i. p. 29.—O. STAPF.

The Aconite which is here figured is one of the most characteristic of those met with in Western Central Asia,

whence it extends into Northern Afghanistan, Baltistan and Northern Bashahr. The tubers are very small as compared with most of its congeners and are of indifferent taste; they produce none of the tingling sensation which distinguishes the poisonous Aconites. It has a considerable altitudinal range, and on the Pensi-la it has been met with growing at 17,000 feet above sea-level; at these high altitudes, however, it becomes much dwarfed. The plant from which the material for this plate of *Aconitum rotundifolium* has been obtained was purchased in 1912 from Messrs. Regel & Kesselring of St. Petersburg, by whom it was issued as *A. albo-violaceum*, which is, however, a member of the section *Lycoctonum*. Grown in an open border at Kew the plant flowered in July under the conditions most suited for other members of the genus; it did not, however, survive the winter. The specimen figured was not quite typical, the ultimate leaf-segments being more acute than usual, the filaments and claws of the nectaries being slightly hairy and the ovaries being nearly glabrous. Similar variations, however, may occasionally be observed in herbarium collections.

DESCRIPTION.—*Herb*, 6–16 in. high; tubers geminate; that of the new season obconic or subcylindric, $\frac{1}{3}$–1 in. long, $\frac{1}{4}$–$\frac{1}{3}$ in. across, beset with long fibrils, in cross-section white, cortex thin pale tawny, the cambium broken up into 4–5 thin scattered cylinders; old tuber blackish; stems erect or ascending, terete, crisply hairy or villous upwards with somewhat spreading hairs, glabrescent below. *Leaves*, some basal arranged in a rosette, with rather long petioles, in wild specimens appearing with the flowers, in cultivated plants already withering before the flowers open, others regularly disposed along the stem, the petioles rapidly shortening upwards; lamina in outline orbicular-cordate or somewhat reniform with a narrow sinus, $\frac{1}{3}$–$1\frac{1}{3}$ in. long from sinus to tip, $\frac{3}{4}$–$2\frac{1}{4}$ in. wide, palmately 5–7-partite to $\frac{4}{5}$ths the length of leaf-blade, the segments wide obovate-cuneate, 3-lobed, or the outermost 2-lobed, lobes sparingly crenate or incised-crenate, the crenations rather blunt or sometimes shortly acute; segments of the upper leaves less divided, with narrower lobes and crenations, all glabrous or often more or less crispately pubescent. *Inflorescence* pubescent or somewhat villous throughout, made up of a few racemes aggregated in a narrow panicle or often reduced to a single raceme; racemes few-flowered; lower bracts 3–5-partite with narrow segments, upper bracts undivided; bracteoles 2, linear-lanceolate or linear or obsolete; pedicels up to $\frac{3}{4}$ in. long, suberect. *Sepals* greenish-white with violet veins and somewhat flushed with purple or violet, the uppermost hooded, more or less beaked, somewhat acute-tipped, about $\frac{3}{4}$ in. long, pubescent; lateral widely obliquely obovate or rounded, about $\frac{2}{3}$ in. long; the lower wide-oblong, blunt, $\frac{1}{4}$–$\frac{1}{3}$ in. long. *Nectaries* with a claw about $\frac{1}{3}$ in. long, glabrous or occasionally pilose below, hood somewhat decurved in front or horizontal and inflated at the tip, lip 2-fid as long as or rather longer than the hood. *Filaments* rather wide-based, becoming much narrowed upwards, toothed or not, glabrous or occasionally hairy. *Carpels* 5, closely connivent in flower, oblong, suddenly narrowed into the style, white pilose, usually the white spreading hairs conspicuous, occasionally very few. *Follicles* oblong, truncate, closely set, $\frac{1}{3}$–$\frac{1}{2}$ in. long, usually pilose. *Seeds* obpyramidal, 3-angled, $\frac{1}{10}$–$\frac{1}{8}$ in. long, the angles unequally winged.

Fig. 1, a flower with two sepals removed; 2, nectary; 3, stamen; 4, pistil:—*all enlarged.*

8576.

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TAB. 8576.

TILLANDSIA BENTHAMIANA, var. ANDRIEUXII.

Central America.

BROMELIACEAE. Tribe TILLANDSIEAE.

TILLANDSIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 669; *Baker, Handb. Bromel.* p. 157; *Mez in DC. Monogr. Phan.* vol. ix. p. 633.

Tillandsia Benthamiana, *Klotzsch ex Beer, Bromel.* p. 263, *ex Baker, Journ. Bot.* 1888, p. 15 *et Handb. Bromel.* p. 199, *et ex Mez in DC. Monogr. Phan.* vol. ix. p. 735: var. **Andrieuxii,** *Mez* l.c. p. 736; varietas a *T. Benthamiana* typica floribus minoribus, petalis purpureis, scapi vagina breviter acuta, bracteisque superioribus apice rotundatis apte distinguenda.

Herba succulenta, subacaulis, epiphytica. *Folia* dense subrosulata, numerosa, e basi ovato-lanceolata sensim attenuata superne ensiformi-acuminata, 15 cm. longa, basi 1·2 cm., supra basin 6 mm. lata, crassiora, subrigida, margine subincurva, superiora erecta vel adscendentia, inferiora recurva, utrinque papillis patentibus vesiculosis dense vestita. *Scapus* 7–15 cm. longus, foliis saepius brevior, raro folia subaequans; bracteae foliaceae congestae. *Inflorescentia* spicata; spica oblonga, 7 cm. longa, 3·75 cm. lata; bracteae florales ovatae, apice rotundatae, roseae, albo-lepidotae, 2 cm. longae. *Sepala* ovata, acuta, 1 cm. longa. *Petala* oblanceolata, 3 cm. longa, intense violacea, apice breviter recurva. *Stamina* minopere exserta; filamenta filiformia; antherae 3 mm. longae, luteae. *Ovarium* conicum, glabrum; stylus staminibus aequilongus; stigmata brevia, laxe contorta.—C. H. WRIGHT.

The *Tillandsia* here depicted was received at Kew in 1912 from Mr. C. H. Lankester, Cachi, Costa Rica, along with a number of orchids collected in that country. It has been cultivated in a tropical house, where it flowered in June, 1913, and admitted of the preparation of our plate. It thrives well under the treatment given to other small epiphytic species of the genus. The species of which our plant is a marked variety appears to be rather widely spread in Mexico and is described as having white sepals and greenish petals. The variety now figured was first met with by Mr. G. Andrieux at Chalco in Mexico, where it was epiphytic on a *Quercus*. *T. Benthamiana* is most nearly allied to *T. dianthoidea*, Rossi, a species which is not uncommon in stove collections; one form of the species has been figured at t. 5246 of this work as *T. recurvifolia*, Hook. The two varieties of *T.*

Benthamiana are, however, easily distinguished from the various forms of *T. dianthoidea* by the much longer corolla and the character of the indumentum on the leaves. In *T. Benthamiana* the adpressed scales met with on the leaves of many Bromeliads are replaced by thick vesicular hairs, and it is to the presence of these that the typical plant and the variety here described owe their shaggy aspect.

DESCRIPTION.—*Herb*, succulent, almost stemless, epiphytic. *Leaves* densely clustered, numerous, gradually ensiform-acuminate upwards from an ovate-lanceolate base, 6 in. long, $\frac{1}{2}$ in. wide at the base, $\frac{1}{4}$ in. wide above, rather thick and firm, margin slightly incurved, the uppermost leaves erect or ascending, the lowest recurved, all densely clothed on both faces with spreading vesicular papillae. *Scape* 3–6 in. long, usually shorter than the leaves; leafy bracts congested. *Inflorescence* spicate, oblong, 3 in. long, $1\frac{1}{2}$ in. across; flowering bracts ovate with rounded tips, rosy pink, white-lepidote, $\frac{3}{4}$ in. long. *Sepals* ovate, acute, $\frac{1}{3}$ in. long. *Petals* oblanceolate, $1\frac{1}{4}$ in. long, deep violet, slightly recurved at the tip. *Stamens* little exserted; filaments filiform; anthers $\frac{1}{8}$ in. long, yellow. *Ovary* conic, glabrous; style as long as the stamens; stigmas short, loosely twisted.

Fig. 1, portion of a leaf; 2, vesicular hairs, or modified scales, from leaf; 3, calyx; 4, corolla; 5 and 6, anthers; 7, pistil:—*all enlarged.*

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BOTANICAL MAGAZINE.

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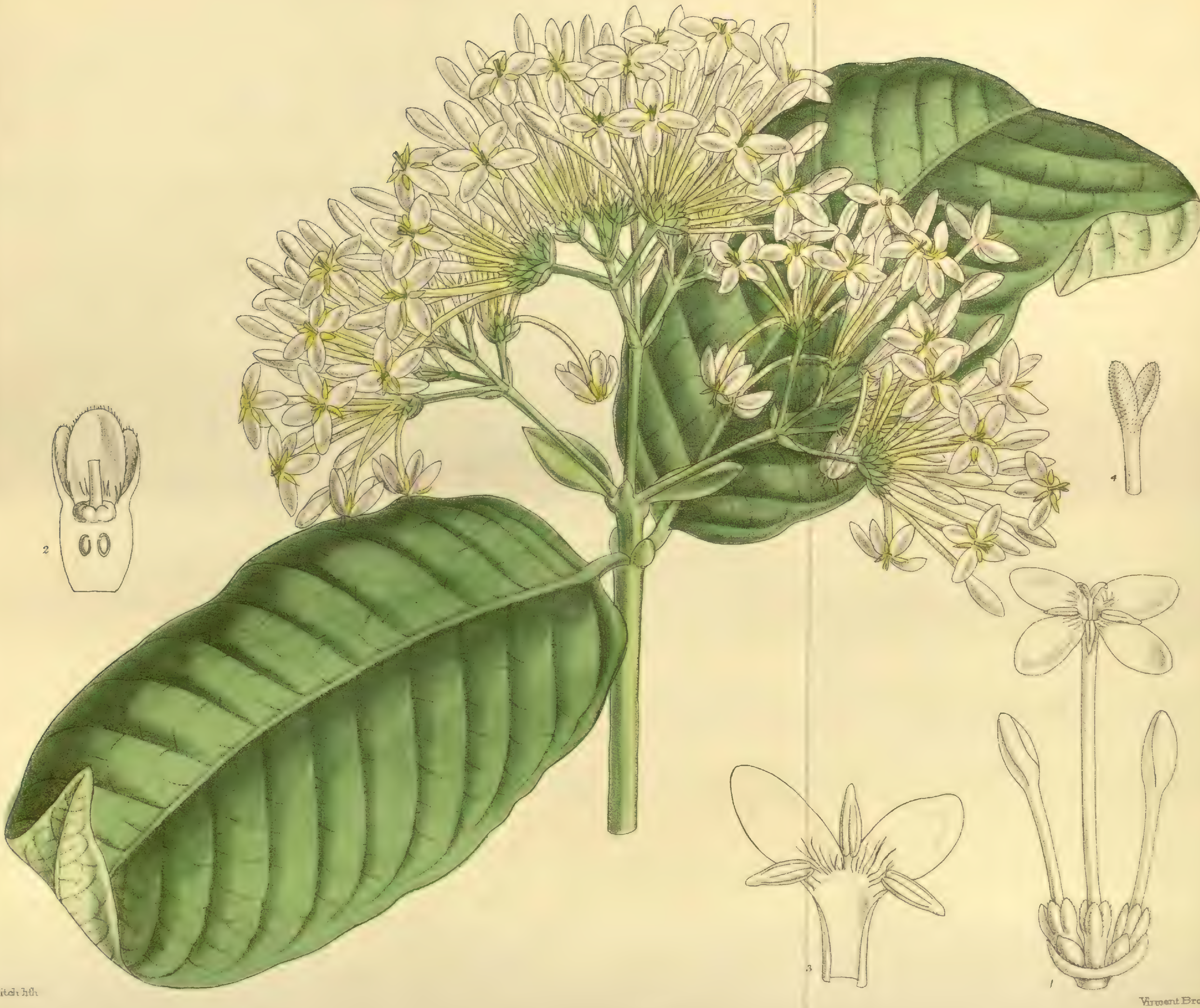

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TAB. 8577.

IXORA UMBELLATA.

Java.

RUBIACEAE. Tribe IXOREAE.

IXORA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 113.

Ixora umbellata, *Valet. ex Koord. & Valet. in Meded.'s Lands Plantent.* vol. lix. (1902), p. 162; *Valet. in Ic. Bogor.* vol. ii. t. clxxxiii.; affinis *I. congestae*, Roxb., sed foliis latioribus floribus albis calycis lobis multo majoribus imbricatis differt.

Frutex ramosus; rami teretes, circiter 5 mm. crassi, glabri. *Folia* elliptica vel oblongo-elliptica, apice breviter et obtuse acuminata, basi rotundata, 15–25 cm. longa, 7–11 cm. lata, integra, membranaceo-chartacea, glabra; costa media supra plana, infra prominens, ad apicem laminae gradatim attenuata; nervi laterales utrinsecus 15–17, arcuati, graciles, intra marginem valde ramosi, utrinque distincti, infra prominuli; venae laxissimae; petioli 1–1·5 cm. longi; stipulae in tubum 0·5 cm. longum connatae, intra glandis linearibus 1·5 mm. longis instructae. *Flores* albi, in corymbos terminales circiter 15 cm. expansos dispositi; bracteolae obovato-oblongae, obtusae, circiter 2·5 mm. longae, breviter ciliatae. *Receptaculum* obconicum, 1·25 mm. altum, glabrum. *Calyx* alte lobatus; lobi valde imbricati, late ovati, 1·75 mm. longi, ciliati. *Corollae* tubus gracilis, ad apicem paullulum latior, 3 cm. longus, extra glaber, fauce tenuiter villosus; limbus 2 cm. expansus, demum reflexus; lobi 4, oblanceolato-oblongi, apice rotundati, 7–8 mm. longi, 4 mm. lati, glabri. *Antherae* exsertae, 4 mm. longae, acute acuminatae. *Discus* lobatus. *Stylus* exsertus, glaber, ramis 1·75 mm. longis.—J. HUTCHINSON.

The *Ixora* here figured has been in cultivation at Kew since 1889, in which year it was presented to the collection by the late Dr. Treub, the distinguished Director of the Botanic Garden at Buitenzorg in Java, of which island it is a native, though it appears now to be very rare there in a wild state. The most recent record of its occurrence as a wild species is one by Dr. Hallier, by whom it was met with in a wood near Dépok, south of Batavia. Its nearest ally in the genus appears to be *I. congesta*, Roxb., a native of Burma and Malaya, figured at t. 4325 of this work as *I. Griffithii*, Hook., which, however, differs from *I. umbellata* in having red flowers. In a tropical house at Kew *I. umbellata* forms a large branching shrub which flowers freely in May and June.

OCTOBER, 1914.

DESCRIPTION.—*Shrub*, much branched; twigs terete about $\frac{1}{5}$ in. thick, glabrous. *Leaves* elliptic or oblong-elliptic, apex shortly and bluntly acuminate, base rounded, margin entire, thinly papery, glabrous, 6–10 in. long, 3–4$\frac{1}{2}$ in. wide; midrib smooth above, raised beneath, gradually narrowed to the tip of the leaf; lateral nerves 15–17 on each side the midrib, curved, slender, much branched within the margin, visible on both sides and raised on the underside; veins very lax; petiole $\frac{1}{3}$–$\frac{2}{3}$ in. long; stipules connate in a tube $\frac{1}{5}$ in. long, beset within with long linear glands. *Flowers* white, arranged in terminal corymbs about 6 in. across; bracteoles obovate-oblong, obtuse, about $\frac{1}{10}$ in. long, shortly ciliate. *Receptacle* obconic, short, glabrous. *Calyx* deeply lobed; lobes much imbricate, wide-ovate, ciliate. *Corolla* tube slender, slightly widened at the mouth, 1$\frac{1}{4}$ in. long, glabrous outside, throat slightly villous; limb $\frac{3}{4}$ in. wide, at length reflexed; lobes 4, oblanceolate-oblong, rounded at the tip, $\frac{1}{3}$ in. long, $\frac{1}{6}$ in. wide, glabrous. *Anthers* exserted, $\frac{1}{6}$ in. long, acutely acuminate. *Disk* lobed. *Style* exserted, glabrous, branches under $\frac{1}{10}$ in. long.

Fig. 1, flowers; 2, longitudinal section of calyx and ovary; 3, section of upper portion of corolla; 4, stigma:—*all enlarged.*

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TAB. 8578.

CYTISUS PALLIDUS.

Canary Islands.

LEGUMINOSAE. Tribe GENISTEAE.

CYTISUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 484.

Cytisus pallidus, *Poir. Encycl. Meth. Suppl.* vol. ii. p. 442; species a *C. linifolio*, Linn., cui valde affinis, foliolis latioribus facile distinguenda.

Frutex 1–2-metralis. *Ramuli* juventute sericei, mox laxius adpresse argenteo-pubescentes, cortice viridi obtecti, pluri-sulcati. *Folia* trifoliolata, petiolo 1–3 mm. longo simul ac ramulis pubescente suffulta; stipulae plus minusve persistentes, angustae, usque ad 5 mm. longae, sericeae; foliola oblanceolata vel angustius oblanceolata, apice breviter acute acuminata, basi in petiolulum breve attenuata, 1·8–4·5 cm. longa, 3–7 mm. lata, chartacea, pagina superiore laxius adpresse pubescentia, viridia, inferiore sericea, costa supra leviter immersa subtus prominula, nervis lateralibus haud conspicuis, margine saepe parum recurvo. *Flores* in racemum terminalem laxe capituliformem plerumque circiter 10-florum dispositi; bracteae deciduae; pedicelli vix 5 mm. longi, sericei; bracteolae angustae, circiter 8 mm. longae. *Calycis* extra sericei tubus 2 mm. longus; lobi duo supremi 5·5 mm. longi, 2 mm. lati, tres infimi in unum tridentatum connati. *Vexillum* elliptico-ovatum, apice emarginatum, 14·5 mm. longum, 10 mm. latum, extra ad nervos adpresse albo-pubescens, ungui 2·5 mm. longo; alae vix 12 mm. longae, 4·5 mm. latae, ungui 2·5 mm. longo; carina 11·5 mm. longa, 3·5 mm. lata, extra sericea, ungui 2·5 mm. longo, auricula 1·25 mm. longa. *Antherae* difformes, longiores 1·5 mm., breviores 1 mm. longae. *Ovarium* 4 mm. altum, sericeum, stylo superne glabro stigmate minuto.—*C. linifolius*, Lamk., var. *pallidus*, Briquet Cytises Alpes Marit., p. 140. *Teline linifolia*, Webb et Berth., var. *latifolia*, Webb et Berth. Phyt. Canar. vol. ii. p. 42. *Genista splendens*, Webb et Berth. l.c. p. 42, t. 43.—W. G. CRAIB.

The shrub here figured is one that has been raised from seed presented to Kew in 1912 by Dr. G. V. Perez of Puerto Orotava, Teneriffe, under the name *Genista splendens*, which is that given to it by Messrs. Webb and Berthelot on the plate on which it is depicted in their work on the Canaries. In the text of their work, however, it is referred by these authors to the genus *Teline* and treated as a variety of what is now once more regarded as *Cytisus linifolius*, Lamk. More recently Professor Briquet has returned to the same view and there is no question that *C. linifolius* is the nearest ally of *C. pallidus*, while there is little doubt that Mr. Craib is fully justified in treating the latter as a distinct species. In the Temperate House at Kew *C. pallidus* has formed a freely branching shrub four feet high, pleasing on account of the silvery pubescence of its leaves and for its terminal clusters of slightly fragrant yellow flowers, which appear in April. Under suitable conditions it is likely to reach twice to thrice the height mentioned, so that it can only be conveniently grown in a large greenhouse.

DESCRIPTION.—*Shrub* 4–10 ft. high; twigs silky when young, soon loosely adpressed silvery-pubescent; bark green, striate. *Leaves* 3-foliolate; petiole $\frac{1}{3}$–$1\frac{1}{4}$ in. long, pubescent like the twigs; stipules more or less persistent, narrow, $\frac{1}{6}$ in. long, silky; leaflets oblanceolate or narrow-oblanceolate, shortly sharply acuminate, narrowed at the base into a short petiolule, $\frac{2}{3}$–$1\frac{3}{4}$ in. long, $\frac{1}{8}$–$\frac{1}{4}$ in. wide, papery, rather loosely adpressed-pubescent on the upper surface, green silky on the under surface, midrib slightly impressed above and raised beneath, lateral nerves not prominent, margin often slightly recurved. *Flowers* arranged in loosely clustered terminal 10-flowered racemes; bracts deciduous; pedicels about $\frac{1}{6}$ in. long, silky like the calyx; bracteoles narrow, about $\frac{1}{3}$ in. long. *Calyx* somewhat 2-labiate; tube $\frac{1}{12}$ in. long; the two upper lobes $\frac{1}{4}$ in. long, $\frac{1}{12}$ in. wide, the three lower connate in a 3-toothed lip. *Standard* elliptic-ovate, emarginate at the tip, over $\frac{1}{2}$ in. long, over $\frac{1}{3}$ in. wide, outside white-pubescent with adpressed hairs along the nerves; claw $\frac{1}{10}$ in. long. *Wings* under $\frac{1}{2}$ in. long, $\frac{1}{6}$ in. wide; claw $\frac{1}{10}$ in. long. *Keel* distinctly auriculate, under $\frac{1}{2}$ in. long, $\frac{1}{7}$ in. wide, silky outside; claw $\frac{1}{10}$ in. long. *Anthers* long and short. *Ovary* $\frac{1}{6}$ in. long, silky; style glabrous upwards; stigma minute.

Fig. 1, portion of a leaflet; 2, flower, the petals removed, showing the three bracteoles; 3, wing-petal; 4, keel-petals; 5, pistil; 6, longitudinal section of the ovary:—*all enlarged.*

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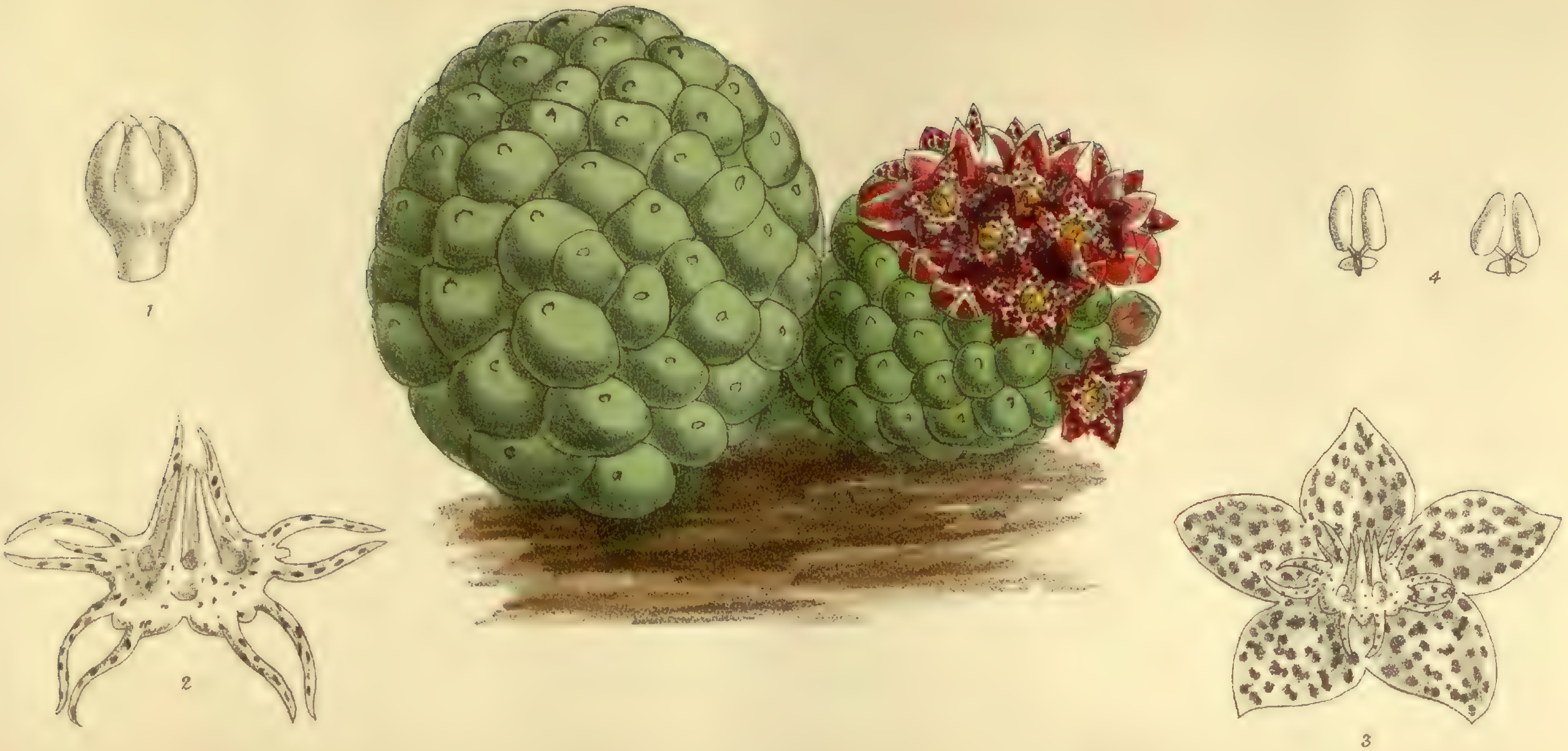

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TAB. 8579.

TRICHOCAULON PICTUM.

Little Namaqualand.

ASCLEPIADACEAE. Tribe STAPELIEAE.

TRICHOCAULON, *N. E. Br. in Journ. Linn. Soc.* vol. xvii. p. 164.

Trichocaulon pictum, *N. E. Br. in Kew Bulletin*, 1909, p. 307; affinis *T. cactiformi*, N. E. Br., sed corona in tubum distinctum haud inclusa et coronae interioris lobis supra antheras productis differt.

Herba; caulis subglobosus vel cylindrico-oblongus, obtusissimus, simplex vel basi tantum parce ramosus, 4–7 cm. longus, 4–5 cm. crassus, irregulariter tessellato-tuberculatus, glaber, tuberculis 6–10 mm. diametro obtusissimis primum minute apiculatis. *Flores* fasciculati, erecti, fasciculis 2–4-floris. *Pedicelli* 2 mm. longi, glabri. *Sepala* 1–1·5 mm. longa, late ovata, acuta, glabra. *Corolla* 9 mm. diametro, extra levis, intra minute rugulosa, glabra, albida punctis et lineis brevibus numerosis purpureis notata; tubus late patelliformis vel subplanus; lobi patentissimi, 2·5 mm. longi, 3 mm. lati, late deltoideo-ovati, acuti. *Corona exterior* 5-loba; lobi 1·5 mm. longi, trifidi vel bifidi cum denticulo intermedio interjecti, fere ad sinum corollae attingentes, pallide lutescentes, purpureo-maculati. *Coronae interioris* lobi 1·5 mm. longi, lineares, acuti, antheras excedentes apicibus conniventi-erectis, lutescentes, purpureo-marginati.—N. E. BROWN.

The remarkable plant which is here depicted is one of a small group of species of *Trichocaulon* which, as regards their stems, resemble one another so closely that when out of flower they might pardonably be mistaken for forms of the same species. Yet they are so distinct as regards the colour and the structure of their flowers that they cannot with propriety be treated as conspecific. The extent of the difference between one such form and another may be best realised if the figure now given of *T. pictum* be compared with that of *T. cactiforme*, N. E. Br., figured, as *Stapelia cactiformis*, at t. 4127 of this magazine. *T. pictum* was originally discovered in Little Namaqualand by Dr. R. Marloth. It was met with again by Professor H. H. W. Pearson in the same country, during the course of the Percy Sladen expedition, on the northwestern slopes of quartzite hills south-west of Chubiessis, and the plant from which our drawing has been made is one of those included in a magnificent collection of

succulent plants received from Professor Pearson as part of the fruits of his journey. It has thriven well in the Tropical Succulent House at Kew and flowered here for the first time in June, 1912.

Description.—*Herb*; stem subglobose or cylindric-oblong, very blunt, simple or sparingly branched at the very base, 1½–3 in. long, 1½–2 in. thick, irregularly tessellately tubercled, glabrous; tubercles ¼–⅓ in. wide, very blunt, at first minutely apiculate. *Flowers* fascicled, erect; fascicles 2–4-flowered. *Pedicels* $\frac{1}{12}$ in. long, glabrous. *Sepals* small, wide-ovate, acute, glabrous. *Corolla* ⅓ in. across, smooth externally, minutely rugulose within, glabrous, whitish but marked with many close-set purple dots and short streaks; tube wide-patelliform or almost flat; lobes spreading, $\frac{1}{10}$ in. long, over $\frac{1}{10}$ in. wide, broadly deltoid-ovate, acute. *Outer corona* 5-lobed; lobes short, trifid or bifid with a short intermediate tooth, almost reaching the sinuses between the corolla lobes, pale yellowish blotched with purple. *Inner corona* with short, linear, acute lobes rather larger than the anthers, their tips erect-connivent, yellowish with purple margins.

Fig. 1, calyx from which the corolla has fallen; 2, a flower; 3, corona; 4, pollen-masses:—*all enlarged.*

8580.

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TAB. 8580.

INDIGOFERA KIRILOWII.

N. China.

LEGUMINOSAE. Tribe GALEGEAE.

INDIGOFERA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 494.

Indigofera Kirilowii, *Maxim. ex Palibin in Act. Hort. Petrop.* vol. xvii. p. 62, t. 4 (speciebus nonnullis citatis exclusis); *Craib in Notes Roy. Bot. Gard. Edin.* n. xxxvi. p. 66; ab affini *I. elliptica*, Roxb., pedunculo communi petiolo longiore facile distinguenda.

Frutex; ramulis juventute pilis perpaucis albis brevibus medifixis instructi, cito omnino glabri, parum angulati, cortice mox tenuiter striato obtecti. *Folia* 7–9-foliolata, ad 12 cm. (petiolo excluso) longa, petiolo 1·2–3·2 cm. longo simul ac rhachi supra canaliculato et nisi juventute glabro suffulta; stipulae circiter 7 mm. longae, angustae, acutae, diutius persistentes; foliola saepissime opposita, elliptica vel rotundato-elliptica, apice obtusa vel rotundata, mucronata, basi cuneata ad rotundato-cuneata, usque ad 3 cm. longa et 2·5 cm. lata, chartacea vel tenuiter chartacea, pagina utraque pilis albis medifixis adpressis sparse instructa, nervis lateralibus utrinsecus circiter 6 pagina utraque conspicuis, nervis transversis praesertim subtus uti reticulatione conspicuis, petiolulo 2–3·5 mm. longo suffulta; stipellae petiolulo dimidio breviores. *Racemi* ex axillis bene infra apicem ramulorum orti, folia superantes, pedunculo communi petiolo circiter duplo longiore suffulti; bracteae deciduae; pedicelli 3–4 mm. longi, ut rhachi glabri; corolla in alabastro nisi summo apice et ad vexilli margines glabra. *Calyx* glaber; tubus 2 mm. longus, lobo longissimo aequilongus. *Vexillum* oblongo-ellipticum, 1·7 cm. longum, 1 cm. latum, ciliatum; alae 2·75 mm. latae, vexillo parum breviores, ciliatae; carina acuminata, vexillo aequialta, ciliata. *Antherae* insigniter apiculata, apice basique ciliis paucis instructae. *Ovarium* compressum, glabrum, circiter 8-ovulatum, stylo glabro stigmate capitato.—*I. macrostachya*, Bunge, Enum. Pl. Chin. Bor. p. 16; Franch. Pl. David. p. 82; Forbes et Hemsl. in Journ. Linn. Soc. vol. xxiii. p. 157 partim; vix Vent.—W. G. CRAIB.

The *Indigofera* here figured is a species represented in the Kew collection by examples received from two distinct sources. In one case the collection owes the plant to the kindness of Mr. M. L. de Vilmorin, who has contributed it from his garden at Les Barres. In the other it is indebted for the plant to the kindness of Professor Sargent of the Arnold Arboretum. The material for our illustration has been taken from the latter plant. The native habit of *I. Kirilowii* includes Chihli, Shenking and Shantung in Northern China; it also extends into Korea. Bunge, who first had to deal with this plant, referred it doubtfully to *I. macrostachya*, Vent., which has, however, more numerous leaflets, much smaller flowers and a short common peduncle. The fact that *I. Kirilowii*

differs from *I. macrostachya* was first observed by Maximowicz, though this observation was not published until after Maximowicz' death. The species is very attractive on account of its delicately coloured flowers which continue to develop in succession from the leaf-axils during June and July as the shoots lengthen. These shoots die back almost to the ground-level during the winter, but the plant can be propagated by making cuttings of them in the late summer. *I. Kirilowii* prefers a warm loamy soil and a sunny position.

DESCRIPTION.—*Shrub*; twigs usually dying back, when young bearing a few short white hairs attached by their centres, soon quite glabrous, slightly angular, bark soon striate. *Leaves* 7–9-foliolate, up to 5 in. long not including the leaf-stalk which is $\frac{1}{2}$–$1\frac{1}{3}$ in. long, is channelled above like the rhachis, and is glabrous save when young; stipules about $\frac{1}{4}$ in. long, narrow, acute, rather long-persisting; leaflets usually opposite, elliptic or rounded-elliptic, obtuse or rounded at the tip, mucronate, cuneate or rounded-cuneate at the base, up to $1\frac{1}{4}$ in. long and 1 in. wide, papery or thinly papery, both surfaces sparingly beset with short white centrally attached hairs, lateral nerves about 6 on each side the midrib, visible both above and below, tranverse nerves visible like the reticulation especially beneath; petiolules $\frac{1}{12}$–$\frac{1}{7}$ in. long; stipels a half shorter than the petiolules. *Racemes* in the axils of leaves well down the twigs, larger than the leaves, with a common peduncle about twice as long as the petiole; bracts deciduous; pedicels $\frac{1}{8}$–$\frac{1}{6}$ in. long, glabrous like the rhachis; corolla glabrous in bud except at the very tip and on the margin of the standard. *Calyx* glabrous; tube $\frac{1}{12}$ in. long, as long as the longest tooth. *Standard* oblong-elliptic, $\frac{2}{3}$ in. long, $\frac{1}{3}$ in. wide, ciliate; wings $\frac{1}{9}$ in. wide, rather shorter than the standard, ciliate; keel acuminate, as long as the standard, ciliate. *Anthers* very apiculate, with a few ciliae at the apex and at the base. *Ovary* compressed, glabrous, about 8-ovuled; style glabrous; stigma capitate.

Fig. 1, flower with petals removed; 2, standard; 3, wings; 4, keel; 5 and 6, anthers:—*all enlarged*.

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TAB. 8581.

AGAVE BRACTEOSA.

Northern Mexico.

AMARYLLIDACEAE. Tribe AGAVEAE.

AGAVE, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 738; *Baker, Handb. Amaryll.* p. 163.

Agave bracteosa, *S. Wats. ex Engelm. in Gard. Chron.*, 1882, vol. xviii. p. 776, fig. 138–139; *S. Wats. in Proc. Amer. Acad.* vol. xviii. p. 162 (1883); *Baker. Handb. Amaryll.* p. 192; *Hemsl. in Biol. Centr.-Amer.* vol. iii. p. 340; species *A. pruinosae*, Lemaire, affinis, sed planta acaulescente foliisque e basi dilatata ad apicem gradatim attenuatis differt.

Frutex; acaulescens. *Folia* circiter 50 rosulatim disposita, e basi 6 cm. lata et 1·5 cm. crassa ad apicem longe acuminatum gradatim attenuata, 60 cm. longa, supra basin 3·5 cm. lata, primum sursum curvata, demum valide decurva, plano-convexa, marginibus tenuibus minute denseque albo-dentatis, subscabrida. *Pedunculus* 12 dm. altus; bracteae plures, subulatae, recurvatae, ad 15 cm. longae; spica 60 cm. longa, densiflora. *Perianthium* viride, segmentis albo-marginatis; tubus brevissimus; segmenta ovato-oblonga, obtusa, patentia, 12 mm. longa, 7 mm. lata. *Filamenta* filiformia, alba, 6 cm. longa; antherae oblongae, luteae, 8 mm. longae. *Ovarium* fusiforme, viride, 15 mm. longae, 5 mm. diametro; stylus albus, stamina demum paulo superans; stigma punctiforme. *Capsula* oblonga, obtusa, 2 cm. longa.—C. H. WRIGHT.

The *Agave* which forms the subject of our illustration is a very distinct species belong to the section *Littaea*, which differs from *A. pruinosa*, Lemaire, where the leaves are also finely dentate, in having the leaves gradually tapered upwards from a short thickened base, whereas in *A. pruinosa* the leaves are oblong-oblanceolate, and are four inches broad or broader above the middle, but contract to two and a half inches or less just above the base. When first described *A. bracteosa* was believed to have about fifteen leaves in its rosette, but under cultivation the plants have developed many more. *A. bracteosa* was discovered by Dr. E. Palmer about fifteen miles from Monterey in the province of Nuevo Leon in Northern Mexico, and was introduced by him to the Harvard Botanic Garden, where it flowered for the first time in 1881. It was met with again by Mr. Pringle in the same district in June 1889, growing on 'dry calcareous mountain walls.' The plant from which the material for our

figure has been obtained was received at Kew in 1888 from the Botanic Garden at Washington. It flowered here for the first time in the Succulent House in July 1910, and a second plant of the same batch has flowered in the same month in 1914. Before perishing the 1910 plant matured seeds from which a supply of seedlings have been raised. The facies of this species renders it very distinct among the Agaves; the younger leaves show a strong sigmoid upward curve; afterwards they become strongly decurved. Another *Agave* with a somewhat similar appearance is *A. yuccaefolia*, DC., figured at t. 5213 of this work. This species differs, however, from *A. bracteosa* in having a short stem. Its yellow filaments, flushed with red, are much shorter in proportion to the size of the perianth than is the case in *A. bracteosa.*

Description.—*Shrub*; almost stemless. *Leaves* about 50 in a basal rosette, 2½ in. wide and ⅔ in. thick at the base, just above the base abruptly narrowed to 1¼ in., thence gradually tapering to a long acuminate tip, at first curved upwards, at length strongly decurved, plano-convex, the thin margins closely and finely white-denticulate, rather scabrid. *Pole* 6 ft. high, the peduncle 4 ft., the spike 2 ft. long; bracts numerous, subulate, up to 6 in. long, recurved; spike dense-flowered. *Perianth* green, segments white-margined, ovate-oblong, obtuse, spreading, ½ in. long, ¼ in. wide; tube very short. *Filaments* filiform, white, 2¼ in. long; anthers oblong, yellow, ⅓ in. long. *Ovary* fusiform, green, ⅔ in. long, ⅕ in wide; style white, ultimately rather longer than the stamens; stigma minute. *Capsule* oblong, obtuse, ¾ in. long.

Fig. 1, portion of leaf-edge; 2 and 3, anthers: 4, stigma; 5, sketch of an entire plant:—*all enlarged except 5, which is much reduced.*

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BOTANICAL MAGAZINE.

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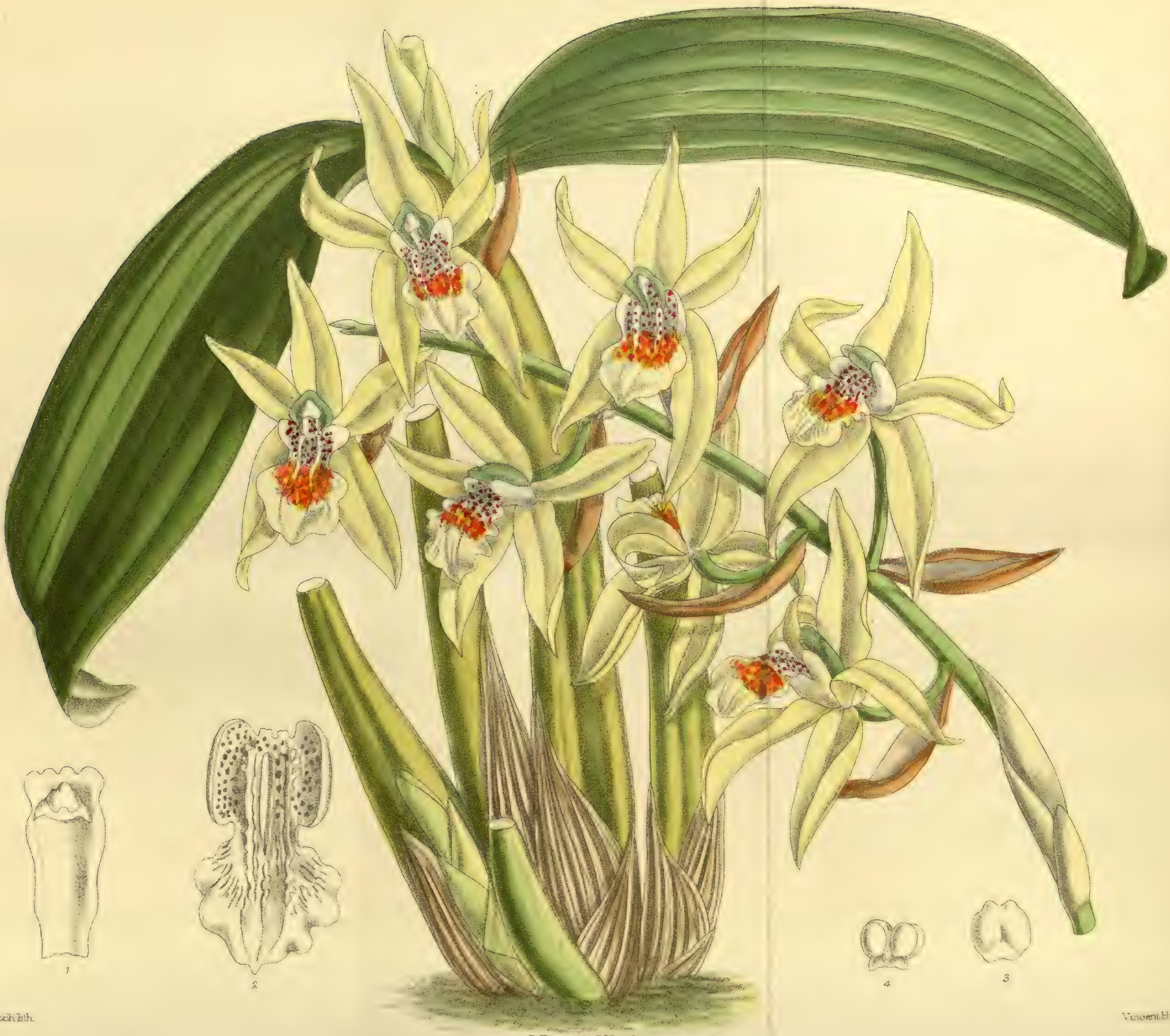

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TAB. 8582.

COELOGYNE BRACHYPTERA.

Burma.

ORCHIDACEAE. Tribe EPIDENDREAE.

COELOGYNE, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 518.

Coelogyne brachyptera, *Reichb. f. in Gard. Chron.* 1881, vol. xvi. p. 6; *Hook. f. Fl. Brit. Ind.* vol. v. p. 842; *Pfitz. in Engl. Pflanzenr.—Orch.-Coelog.* p. 78; species *C. Parishii*, Hook. f. quam maxime affinis, sed labelli disco aurantiaco nec dense papilloso differt.

Herba epiphytica. *Pseudobulbi* elongati, subtetragoni, basi paullo incrassati, 9–15 cm. longi, basi vaginis ovato-spathaceis tecti, apice diphylli. *Folia* elliptico-lanceolata, subacuta, plicata, 12–15 cm. longa. *Scapi* terminales, erecti, basi vaginis lanceolatis imbricatis obtecti, 15–18 cm. longi; racemi circiter 7-flori. *Bracteae* lanceolatae, acutae, concavae, 2·5–3 cm. longae. *Pedicelli* 2–2·5 cm. longi, persistentes. *Flores* speciosi, flavo-virides, labelli disco aurantiaco. *Sepala* patentia; posticum ovato-lanceolatum, subacutum, 3–3·5 cm. longum; lateralia oblongo-lanceolata, acuta, 3–3·5 cm. longa. *Petala* oblongo-lanceolata, acuta, 2·5–3 cm. longa. *Labellum* trilobum, circiter 2·5 cm. longum; lobi laterales suborbiculares, undulati; lobus intermedius orbicularis, undulatus, 1·5 cm. latus; discus graciliter tricarinatus, carinis flexuosis et prope apicem paullo verrucosis. *Columna* clavata, incurva, alata, 1·5 cm. longa.—*C. Parishii* var. *brachyptera*, Pfitz. in Engl. Pflanzenr.—Orch.-Coelog. p. 78.—R. A. ROLFE.

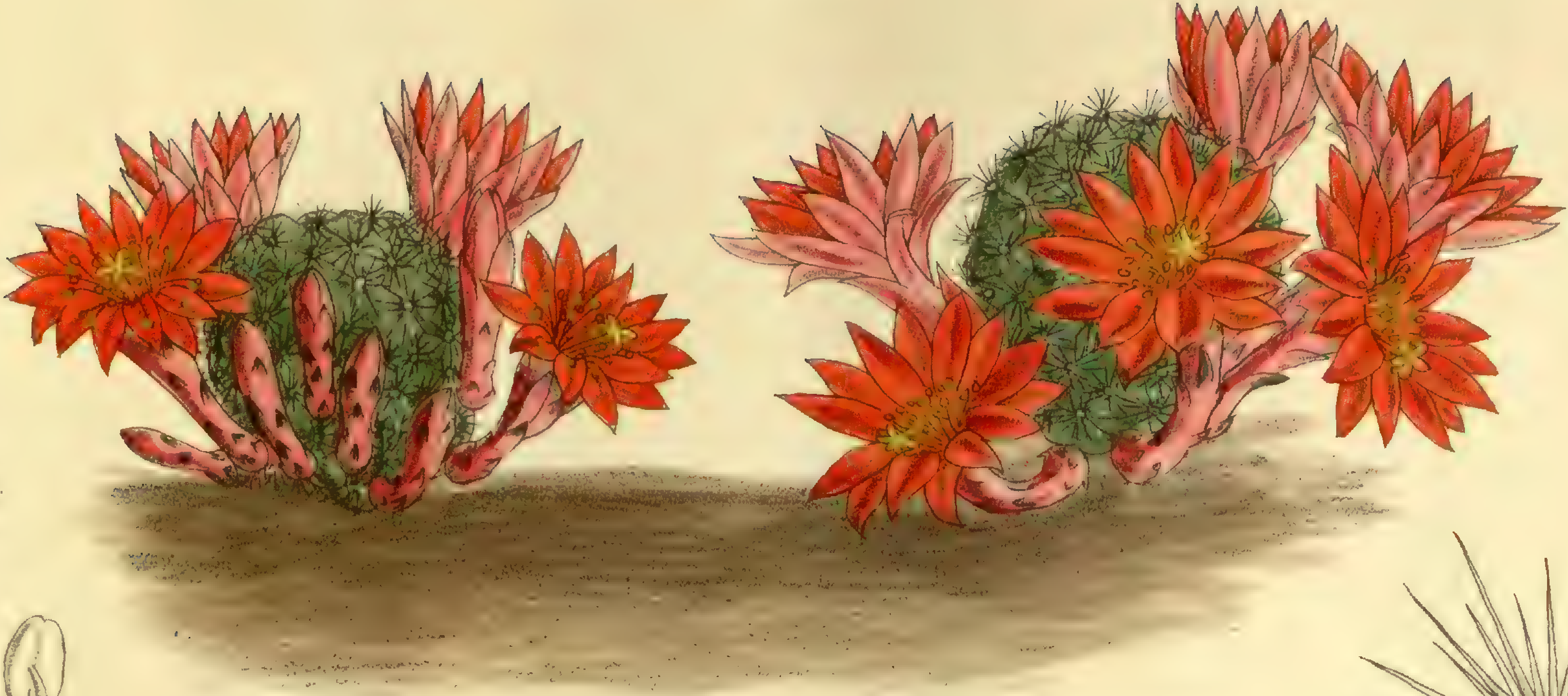
The orchid here figured has long been a source of perplexity to students of its natural family. It was described as long ago as 1881 from material sent to the late Professor Reichenbach by Messrs. Hugh Low and Company, taken from a plant which the firm had imported from Burma. The author of the species *C. brachyptera* expressed the opinion that it was allied to *C. lentiginosa*, Lindl., to which he might have referred it but for the elongated, tetragonal pseudobulbs. From 1881 onwards the species was lost sight of. It was enumerated by Sir J. D. Hooker among the orchids of India, but only as a doubtful species, with the remark that it might possibly be the same thing as *C. Parishii*, Hook.; perhaps this suggestion may have been based on the very distinctive habit of these two plants. Professor Pfitzer has also found some difficulty in dealing with the species which he has enumerated in one place as a dis-

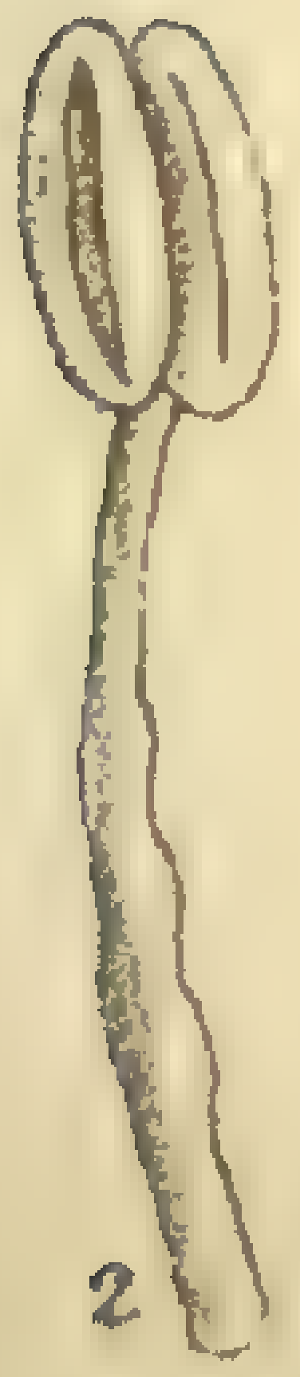
tinct one, in another as only a variety of *C. Parishii.* In 1910 a small collection of orchids from Tenasserim was presented to Kew by Mr. H. Tilly, of Moulmein. One of these was the *Coelogyne* which forms the subject of our illustration. It was, when it arrived, rather a small plant, but it has grown well in the Tropical Orchid House under the treatment suitable for *C. lentiginosa*, Lindl., for which *C. brachyptera* was taken until it flowered, which it did for the first time in May, 1914. Although no type specimen of *C. brachyptera* is available for comparison, the orange disk of the lip and the absence of the numerous elongated processes justify at once the separation of this plant from *C. Parishii* and its reference to the long lost species.

DESCRIPTION.—*Herb*, epiphytic; pseudobulbs elongated, somewhat 4-angled, slightly thickened at the base, $3\frac{1}{2}$–6 in. long, clothed at the base with ovate spathaceous sheaths, 2-foliate at the apex. *Leaves* elliptic-lanceolate, subacute, plicate, 5–6 in. long. *Scapes* terminal, erect, clothed at the base with lanceolate, imbricate sheaths 6–$7\frac{1}{2}$ in. long; racemes about 7-flowered; pedicels $\frac{3}{4}$–1 in. long, persistent. *Flowers* showy, greenish-yellow, lip with an orange-coloured disk. *Sepals* spreading; posterior ovate-lanceolate, subacute, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long; lateral oblong-lanceolate, acute, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long. *Petals* oblong-lanceolate, acute, 1–$1\frac{1}{4}$ in. long. *Lip* 3-lobed, about 1 in. long; lateral lobes suborbicular, undulate; mid-lobe orbicular, undulate, $\frac{2}{3}$ in. wide; disk with three slender ridges which are flexuous and slightly verrucose near the tip. *Column* clavate, incurved, winged, $\frac{2}{3}$ in. long.

Fig. 1, column; 2, lip; 3, anther-cap; 4, pollen-masses:—*all enlarged.*

8583

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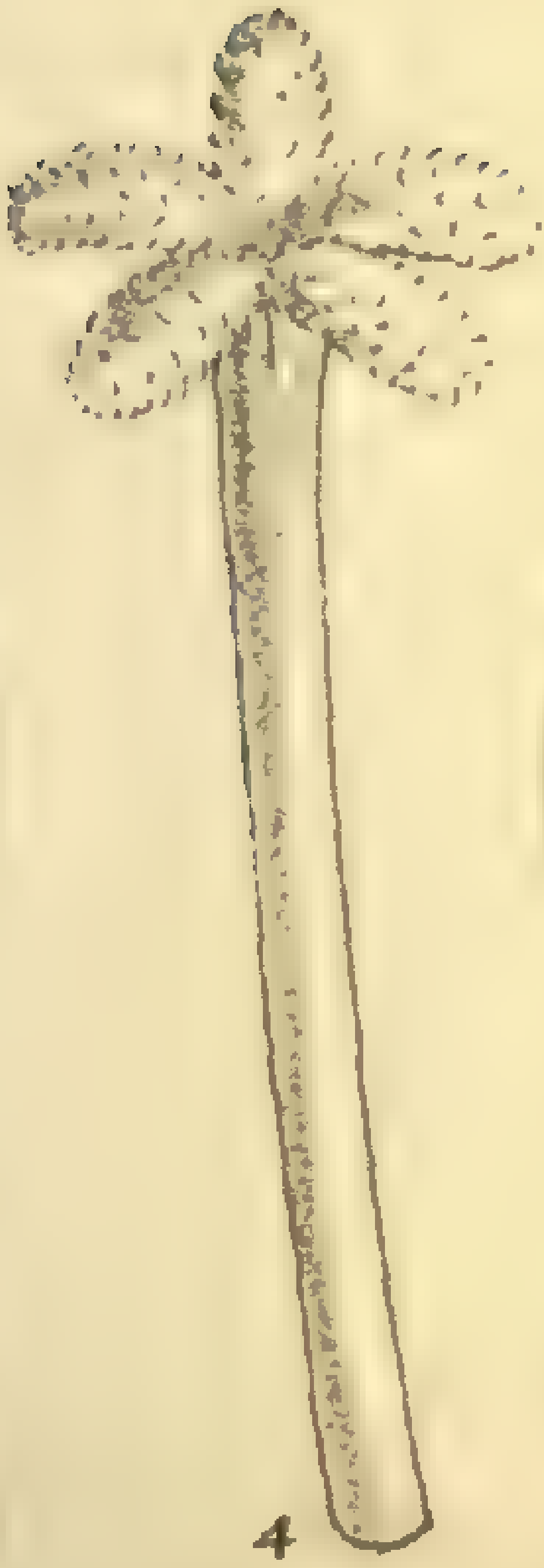
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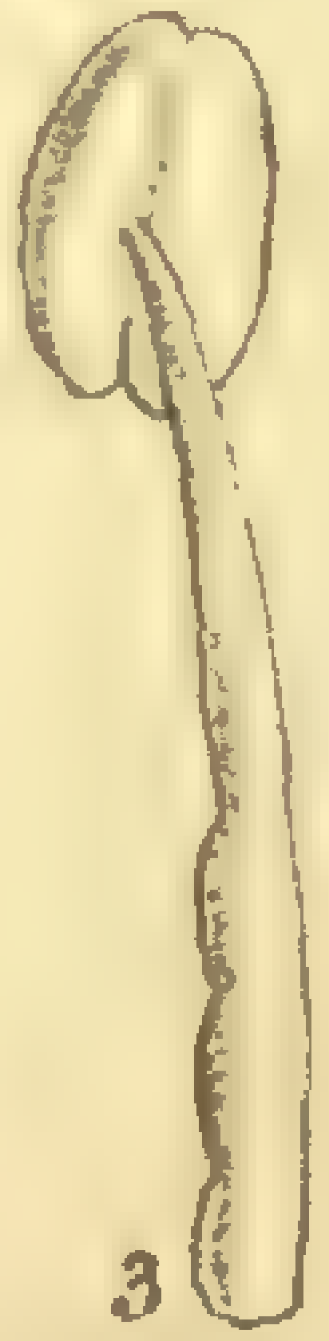
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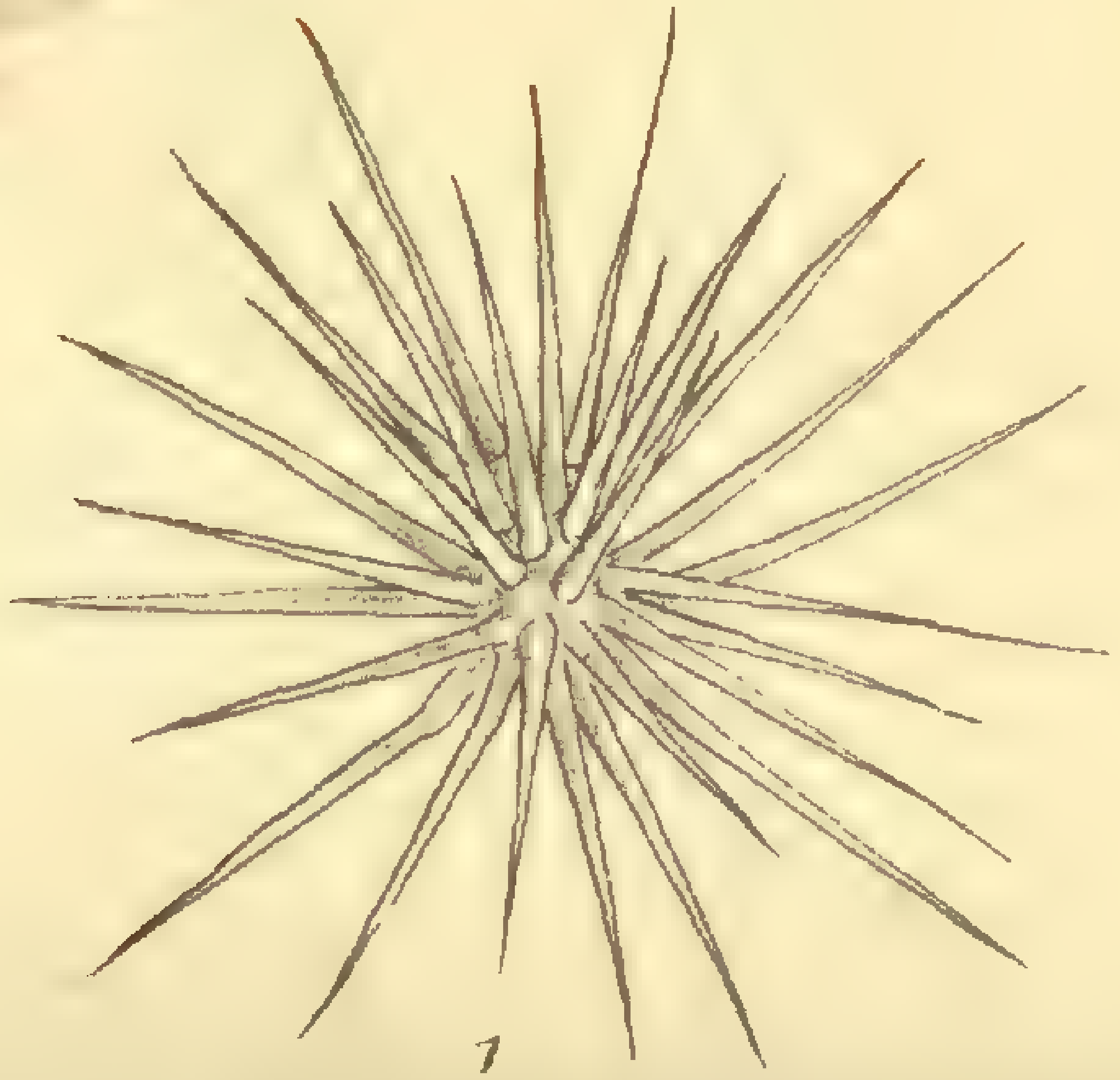
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TAB. 8583.

ECHINOCACTUS MINUSCULUS.

Argentina.

CACTACEAE. Tribe ECHINOCACTEAE.

ECHINOCACTUS, *Link et Otto*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 848.

Echinocactus minusculus, *Weber in Bois, Dict. d'Horticulture,* vol. i. p. 471; *K. Schum., Gesamtb. Kakt.* p. 396, *et in Blüh. Kakt.* vol. i. t. 31; *La Tribune Hort.* 1909, t. 140; affinis *E. Fiebrigii*, Guerke, sed tuberculis minoribus, spinis brevioribus et ovario glabro differt.

Herba succulenta, globosa, vertice depressa, simplex vel prolifera, 2·5–6 cm. diametro; tubercula convexa, spiraliter disposita, 1–2 mm. alta, laete viridia. *Aculei* 25–30, centralibus et radialibus similibus, 2–3·5 mm. longi. *Flores* e basi plantae enati, erecti, elongato-infundibuliformes, 2·5–3 cm. longi et diametro, glabri; tubus gracilis, basi curvatus, pulchre kermesinus cum squamis ovatis acuminatis fusco-rubris conspersus; petala circiter 12, ad 1·5 cm. longa, 4 mm. lata, lineari-oblonga, acuta, apice minute denticulata, pulchre cinnabarina. *Stamina* 15–30, albida. *Stigma* 4–5-lobum, albidum.—*Rebutia minuscula*, K. Schum. in Monatsschr. für Kakt. vol. v. p. 102, cum icon. *Echinopsis minuscula*, Weber in Bois, Dict. d'Horticulture, vol. i. p. 471.—N. E. BROWN.

The *Echinocactus* now figured is a native of the province of Tucuman in Argentina, which was first introduced to European collections of succulent plants in 1894 or 1895 by Mr. Felder of Lichterfelde, who had received it from Mr. Rebat of Chazay d'Azergues, in Argentina. It is one of the most pleasing and at the same time one of the easiest to grow of the small *Cactaceae*, thriving well in an open mixture of turfy loam, sand and mortar-rubbish in an airy sunny greenhouse. Under these conditions it is extremely floriferous and produces seeds in abundance. Each flower, however, lasts only for a day or two. Propagation is readily effected by seeds, and seedlings reach the flowering stage when three to four years old. The plant from which the material for our plate has been obtained was purchased for the Kew Collection in 1913 from Messrs. Cragg, Harrison and Cragg, Nurserymen, Heston. *E. minusculus* and *E. Fiebrigii*, Guerke, agree with each other, and are remarkable in the genus *Echinocactus* for producing their flowers from the base instead of the upper part of the plant, a

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feature which readily distinguishes them from the other species.

DESCRIPTION.—*Herb*, succulent, globose with a depressed apex, simple or proliferous, 1–2¼ in. across; tubercles convex, spirally arranged, under 1 lin. high, bright green; spines in tufts of 25–30, the central and radial similar, 1–1½ lin. long. *Flowers* rising from the base of the plant, erect, long-infundibuliform, 1–1¼ in. long and as much across, glabrous; tube slender, curved at the base, bright crimson, dotted with ovate, acuminate, reddish tawny scales; petals about 12, up to ⅔ in. long, ⅙ in. wide, linear-oblong, acute, minutely denticulate at the tip, bright vermilion. *Stamens* 15–30, whitish. *Stigma* 4–5-lobed, whitish.

Fig. 1, a tuft of spines; 2 and 3, stamens; 4, style and stigmas:—*all enlarged.*

8584.

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TAB. 8584.

NOTHOFAGUS CUNNINGHAMII.

Australia, Tasmania.

FAGACEAE. Tribe FAGEAE.

NOTHOFAGUS, *Bl. Mus. Bot. Lugd.-Bat.* vol. i. p. 307; *Engl. & Prantl, Nat. Pflanzenfam.* vol. iii. pars i. p. 52.—Fagus § Nothofagus, *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 410.

Nothofagus Cunninghamii, *Oerst. in Vidensk. Selsk. Skr.*, ser. 5, vol. ix. (1873), p. 355; *Henry in Elwes & Henry, Trees of Gt. Brit. and Irel.*, vol. iii. p. 550; species *N. Menziesii*, Oerst., proxima, sed foliis grossius crenatis, staminibus multo magis numerosis, involucri valvis latioribus, perianthii lobis multo magis inaequalibus diversa.

Arbor in Tasmania ad 60 m. alta et trunco ad 12 m. ambitu metiente, vel in alpinis *frutex* compactus, humilis, ramulis diu pubescentibus, ramis cortice fusco vel griseo-fusco tectis. *Gemmae* conico-ovoideae, 3–4 mm. longae, glabrae, perulis ovatis vel ovato-oblongis acutis vel subacutis brunneis nitidis. *Folia* sempervirentia, magis minusve deltoideo-ovata vel rhomboidea, acuta, basi late rotundata vel perlate cuneata, crenata, plerumque 1–2 cm. longa et 7–10 mm. lata, sed interdum multo minora vel majora, coriacea, glabra, nervis tenuibus saepe inconspicuis, utrinque 4–5; stipulae lineares, 3 mm. longae, caducae; petioli ad 2 mm. longi, minutissime puberuli. *Flores maris* axillares, solitarii, subsessiles vel pedicello ad 2 mm. longo suffulti. *Perianthium* subcampanulatum, 3 mm. longum, glabrum, lobis 6 ovatis acutis. *Stamina* circiter 8. *Flores foeminei* terni, laterales 3-meri, centralis 2-merus involucro communi cincti, ex axillis superioribus orti. *Involucrum* breviter pedunculatum, 4-valvatum, valvis in dorso glandulosa-apiculatis maturis lineari-oblongis circiter 5 mm. longis appendicibus magis minusve recurvis squarrosis demum deciduis. *Receptaculum* 3-gonum vel centrale anceps angulis alatis. *Perianthium* 6–4-lobum, lobis interangularibus minoribus. *Ovarium* stigmatibus brevibus 3 vel 2 divergentibus. *Fructus* 3- vel 2-alati, 3–3·5 mm. longi, alis ad 1 mm. lati.—*Fagus Cunninghamii*, Hook. f. in Journ. Bot. vol. ii. p. 152, t. 7; Benth. Fl. Austral. vol. vi. p. 210.—O. STAPF.

The Southern Beech which forms the subject of our illustration is that which in Tasmania is spoken of as the "Myrtle-tree." In Tasmania it forms much of the evergreen forest, and occurs on the mountains up to an elevation of 4,000 feet, but towards their summits becomes much dwarfed. It is also met with in various localities in south-eastern Australia. Though not hardy at Kew, and though rarely cultivated at all, *N. Cunninghamii* makes an elegant small tree in the milder parts of the British Isles. There are fine specimens in Ireland at Fota,

near Queenstown, and at Kilmacurragh, while there is a well-known example in the Royal demesne at Osborne, Isle of Wight. It has also lived out of doors in parts of Surrey and Sussex. The date of its first introduction to Europe is uncertain, but the tree at Fota, which is now nearly fifty feet in height, is believed to have been planted half-a-century ago. The figure now given has been prepared from a small tree in cultivation in the Temperate House at Kew, which forms part of the munificent bequest made to the Royal Gardens by the late Mr. George Joad of Wimbledon in 1881. The relationship of *Nothofagus* to *Fagus*—of the Southern to the Northern Beech—has already been discussed in this work at t. 8314. Among the Southern Beeches the present one is clearly closely allied to *N. Menziesii*, Oerst., from New Zealand. Among the South American species the ones which come nearest to the Australian, if the structure of the female inflorescence be taken as our guide, are those which differ from the rest in having deciduous leaves. Like most Southern Beeches this one may be propagated by layering when seeds are not available.

Description.—*Tree*, on the lower mountain slopes in Tasmania sometimes attaining a height of 200 ft. and a girth of 40 ft., but towards the mountain-tops forming a dense dwarf *shrub*; branches clothed with a tawny or pale-tawny bark; twigs long pubescent. *Buds* ovoid-conical, $\frac{1}{8}$–$\frac{1}{6}$ in. long, glabrous; their scales ovate or ovate-oblong, acute or subacute, brown, polished. *Leaves* evergreen, more or less deltoid-ovate or rhomboid, acute, the base wide-rounded or very wide-cuneate, crenate, usually $\frac{1}{3}$–$\frac{3}{4}$ in. long and about $\frac{1}{3}$ in. wide, but sometimes much smaller or much larger, coriaceous, glabrous; nerves slender and often hardly visible, 4–5 along each side; stipules linear, $\frac{1}{8}$ in. long, caducous; petioles $\frac{1}{12}$ in. long or less, very finely puberulous. *Male flowers* axillary, solitary, subsessile or with pedicels $\frac{1}{12}$ in. long or less. *Perianth* subcampanulate, $\frac{1}{8}$ in. long, glabrous; lobes 6, ovate, acute. *Stamens* about 8. *Female flowers* in threes surrounded by a common involucre, the lateral flowers of each cluster 3-merous, the central one 2-merous, the clusters situated in the uppermost leaf-axils. *Involucre* shortly peduncled, 4-valved; the valves glandular-apiculate on the back, when ripe linear-oblong, about $\frac{1}{5}$ in. long, the appendices more or less recurved, squarrose, ultimately deciduous. *Receptacle* 3-gonous or (the central) 2-gonous, the angles winged. *Perianth* 6–4-lobed, the lobes between the angles smaller than the others. *Ovary* with 3 or 2 short divergent stigmas. *Fruit* 3–2-winged, $\frac{1}{8}$–$\frac{1}{7}$ in. long, wings very narrow.

Fig. 1, end of a twig, with male flowers; 2, twig with a male flower, also with fruit; 3, a male flower; 4 and 5, anthers; 6, a lateral female flower; 7, a central female flower:—*all enlarged.*

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TAB. 8585.

LONICERA FRAGRANTISSIMA.

China.

CAPRIFOLIACEAE. Tribe LONICEREAE.

LONICERA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 5; *Rehder in Missouri Bot. Gard. Rep.*, 1903, pp. 27–232.

Lonicera (§ Isika) **fragrantissima,** *Lindl. et Paxt. in Paxt. Fl. Gard.* vol. iii. p. 75, fig. 268 (1852); *Carrière in Fl. des Serr.* sér. ii. vol. iii. (1858), p. 63, et *Rev. Hort.* 1873, p. 169, fig. 17; *K. Koch, Dendr.* vol. ii. (1872), p. 21; *Maxim. Bull. Acad. Sci. St. Pétersb.* vol. xxiv. (1877), p. 42; *Gard. Chron.* 1878, vol. ix. p. 107, fig. 19; *Dippel, Gartenfl.* vol. xxxv. (1886), p. 680, fig. 87, et *Handb. der Laubholzk.* vol. i. (1889), p. 226, fig. 144; *Rehder in Missouri Bot. Gard. Rep.* 1903, p. 82; *Schneider, Ill. Handb. Laubholzk.* vol. ii. (1911), p. 698, fig. 444 f; affinis *L. Standishii*, Carr., sed ramis glabris, foliis ellipticis vel obovato-ellipticis, corollis extra glabris differt.

Frutex ramosus, ramuli elongati, leviter sulcati vel angulati, glabri; internodii usque ad 6 cm. longi. *Folia* elliptica vel obovato-elliptica, basi inaequaliter rotundata, apice acute et abrupte mucronata, 4·5–7 cm. longa, 3–4 cm. lata, integra, chartacea, margine parce setaceo-ciliata, utrinque glabra, subtus glauco-viridia, nervis lateralibus utrinque 5–6 adscendentibus prominentibus marginem versus ramosis; petioli 3–5 mm. longi, primum parce setoso-pilosi, demum glabri. *Flores* albi, axillares, geminati, pedunculati; pedunculi 1–1·5 cm. longi, acute angulati vel subalati, glabri; bracteae geminatae, oppositae, anguste lanceolatae, acutae, 0·5–1 cm. longae, foliaceae, glabrae. *Receptacula* basi breviter connata, ellipsoideo-globosa, 1 mm. longa. *Calyx* cupularis, integer vel margine leviter undulatus, 0·5 mm. altus, viridis. *Corolla* bilabiata; tubus vix 0·5 cm. longus, basi saccatus, extra costatus, glaber, intra pilosus; labium superum 4-lobum, lobis rotundatis 0·5 cm. latis striatis margine minute crenulatis; labium inferum integrum, oblongo-ellipticum, apice rotundatum, 1 cm. longum, 0·5 cm. latum, striatum. *Stamina* exserta; filamenta inaequalia; antherae 3 mm. longae. *Stylus* exsertus, glaber, apice incrassatus, bilobulatus.—*L. caprifolioides*, K. Koch, Ind. Sem. Berol. 1871, app. 3; *et* Dendr. vol. ii. p. 19. *L. Niaguarilli*, Hort., ex Koch, l.c. *L. odoratissima* et *L. Magnevillae*, Hort. ex Dippel Handb. der Laubholzk. vol. i. (1889), p. 226. *Caprifolium fragrantissimum*, Kuntze, Rev. Gen. Pl. vol. i. (1891), p. 274. *L. Volgarensis* et *Chamaecerasus Niaguarilli*, Hort., ex Hand-list Arb. Kew, 1896, p. 15.—J. HUTCHINSON.

The Honeysuckle here figured is a plant which has been in cultivation in England since 1845, when it was introduced from China by the late Mr. Fortune on behalf of the Royal Horticultural Society. It was met with by Fortune in Chinese gardens only, and so far it has never yet been discovered in a wild state. *L. fragrantissima* and the well-known *L. Standishii*, Carr., figured at t. 5709 of this work, for which this species is sometimes mistaken,

are favourite sweet-scented winter-blooming species. *L. Standishii* may, however, be readily distinguished from the present plant by its more precocious habit of flowering, its hairy branches and leaves—the latter being narrower and more pointed—and by its externally pilose corolla-tube. *L. fragrantissima* is easily cultivated and is perfectly hardy, thriving well in rich loamy soil, and being readily propagated by cuttings placed in gentle heat, or even in a close unheated frame, during August. With the object of inducing its fragrant flowers to open sooner, and in order to preserve these from inclement weather, this shrub is sometimes grown against a wall. The plant from which the material for our figure has been prepared is an old denizen of the collection at Kew. It is a rounded bush about six feet high and over six feet in width which flowers every year from December to March.

DESCRIPTION.—*Shrub*, with many branches; twigs long, slightly grooved or angled, glabrous; internodes up to 2½ in. long. *Leaves* elliptic or obovate-elliptic, unequally rounded at the base, apex sharply and abruptly mucronate, 1¾–3 in. long, 1¼–1½ in. wide, entire, chartaceous, the margin sparingly setaceous-ciliate, glabrous on both surfaces, glaucous-green underneath, lateral nerves 5–6 along each side, ascending, raised, branching towards the margin; petiole ⅛–⅕ in. long, at first sparingly setose-hairy, ultimately glabrous. *Flowers* white, axillary, geminate, peduncled; peduncles ⅓–⅔ in. long, acutely angled or almost winged, glabrous; bracts geminate, opposite, narrow lanceolate, acute, ⅕–⅓ in. long, leafy, glabrous. *Receptacles* shortly connate at the base, ellipsoid-globose, very short. *Calyx* cupular, entire or with slightly undulate margin, very short, green. *Corolla* 2-labiate; tube about ⅙ in. long, saccate at the base, ribbed and glabrous outside, hairy within; upper lip 4-lobed, the lobes rounded, ⅕ in. wide, striate and with finely crenulate margin; lower lip entire, oblong-elliptic, rounded at the tip, ⅖ in. long, ⅕ in. wide, striate. *Stamens* exserted; filaments unequal; anthers ⅛ in. long. *Style* exserted, glabrous, thickened at the tip, 2-lobulate.

Fig. 1, flowers; 2, the same with corollas removed; 3 and 4, anthers:—*all enlarged.*

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TAB. 8586.

PRIMULA VITTATA.

Szechuan.

PRIMULACEAE. Tribe PRIMULEAE.

PRIMULA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 631.

Primula vittata, *Bur. et Franch. in Journ. de Bot* vol. v. p. 96; *Pax et Knuth in Engl. Pflanzenr.-Prim.* p. 118; *Gard. Chron.* 1905, vol. xxxvii. p. 390, fig. 165 *et* 1906, vol. xl. p. 209, fig. 87; *Jardin*, 1908, p. 184, fig. 100; *Balf. f. in Journ. Roy. Hort. Soc.* vol. xxxix. p. 159, fig. 63; species *P. secundiflorae*, Franch., peraffinis, foliis angustioribus longioribus distinguenda.

Herba perennis. *Folia* oblanceolata vel latius oblanceolata. basi in petiolum attenuata, apice acuta vel obtusiuscula, usque ad 15 cm. longa et 3 cm. lata, pagina utraque glabra, farinae sulphureae granulis inferiore sparse superiore parcissime instructa, utrinque viridia, nervis lateralibus utrinsecus circiter 12 supra conspicuis subtus prominentibus, margine irregulariter argutius dentata, petiolo valido usque ad 4·5 cm. longo supra plano vel late canaliculato saepius rubro-suffuso suffulta. *Scapus* validus, 18–21 cm. altus, ad 5 mm. diametro, superne albo-farinosus, umbellam 6–16-floram gerens; involucri bracteae ad 7 mm. longae, anguste lanceolatae, virides nisi inferne purpureo-suffusae; pedicelli sub anthesin cernui, ad 3 cm. longi, sparse albo-farinosi. *Calyx* 7–8 mm. longus, tubo 4 mm. longo, lobis lanceolatis vel late lanceolatis acutiusculis, longitudinaliter 10-vittatus, vittis 5 glabris fusco-purpureis in medios lobos productis, 5 albo-farinosis apice bifurcis et cum loborum marginibus anguste farinosis continuis, intus praesertim in lobis albo-farinosus. *Corollae* purpureae tubus 12 mm. longus, apice 8 mm. diametro, limbus campanulatus, 5-lobus, lobis saepe inter se parum inaequalibus, obovato-oblongis apice rotundatis vel nonnonquam retusiusculis ad 5·5 mm. longis et 6 mm. latis. *Filamenta* 0·25 mm. longa, antheris circiter 1·5 mm. longis. *Ovarium* subglobosum, 2 mm. altum; stigma grande, capitatum, viride.—W. G. CRAIB.

The Chinese *Primula* here figured was first met with by Prince Henry of Orleans and Mr. Bonvalot during their Chino-Tibetan journey, and was described from specimens collected in Szechuan. It is a hardy perennial, agreeing in habit with the well-known Himalayan *P. sikkimensis*, Hook. f., figured at t. 4597 of this work, which is the best known member of a section or group of seven species, all of which are yellow-flowered except the present species, *P. vittata*, and another very closely allied one, *P. secundiflora*, Franch., in which the flowers are purple. According to Professor Bayley Balfour, who has made a close study of this group of species, *P. vittata* and *P. secundiflora* are so like each other that they may easily be confused. As a rule they admit of ready separation because in *P. vittata* the leaves are erect and elongated, whereas in *P. secundiflora* they are horizontal

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and are oblong-elliptic. The first introduction of *P. vittata* to this country took place in 1905 when it was raised by Messrs. J. Veitch and Sons from seed obtained on behalf of the firm by Mr. E. H. Wilson. It has since then been found again by Mr. G. Forrest on the Likiang range. Plants raised from seeds sent by Mr. Forrest to Messrs. Bees, Limited, were exhibited at Chelsea in May, 1914; from one of these, purchased for the Royal Gardens, Kew, the material for our plate has been derived. Like most other Chinese Primulas, *P. vittata* prefers moist, shady conditions. It can be propagated by seeds which ripen early and germinate freely in and after August.

Description.—*Herb*, perennial. *Leaves* oblanceolate or broadly oblanceolate, narrowed at the base into the petiole, apex acute or rather blunt, up to 6 in. long, $1\frac{1}{4}$ in. wide, glabrous on both sides, distinctly beset below but very sparingly beset above with granules of a yellow powder, green on both surfaces, lateral nerves about 12 along each side, conspicuous above and raised beneath, margin irregularly rather sharply toothed; petiole stout, $1\frac{3}{4}$ in. long, flat or wide-channelled above, often flushed with red. *Scape* stout, 7–8 in. high, $\frac{1}{6}$ in. thick. white-floury above, supporting a 6–16-flowered umbel; bracts of the involucre over $\frac{1}{4}$ in. long, narrow lanceolate, green and flushed with purple except at the base; pedicels nodding in flower, over 1 in. long, sparingly white-floury. *Calyx* about $\frac{1}{3}$ in. long, tube $\frac{1}{6}$ in. long, lobes lanceolate or wide-lanceolate, somewhat acute, longitudinally 10-vittate; five of the vittae glabrous, tawny-purple, continued into the centre of the lobes, the other five white-floury 2-furcate at the tip and continued along the margins of the lobes, within white-floury, especially on the lobes. *Corolla* purple; tube $\frac{1}{2}$ in. long, $\frac{1}{3}$ in. wide at the top; limb campanulate, 5-lobed, lobes often slightly unequal, obovate-oblong with rounded or occasionally slightly retuse tips, about $\frac{1}{4}$ in. wide and nearly as long. *Filaments* very short; anthers short. *Ovary* subglobose, $\frac{1}{12}$ in. high; stigma large, capitate, green.

Fig. 1, flower with corolla removed; 2, section of corolla; 3, pistil:—*all enlarged.*

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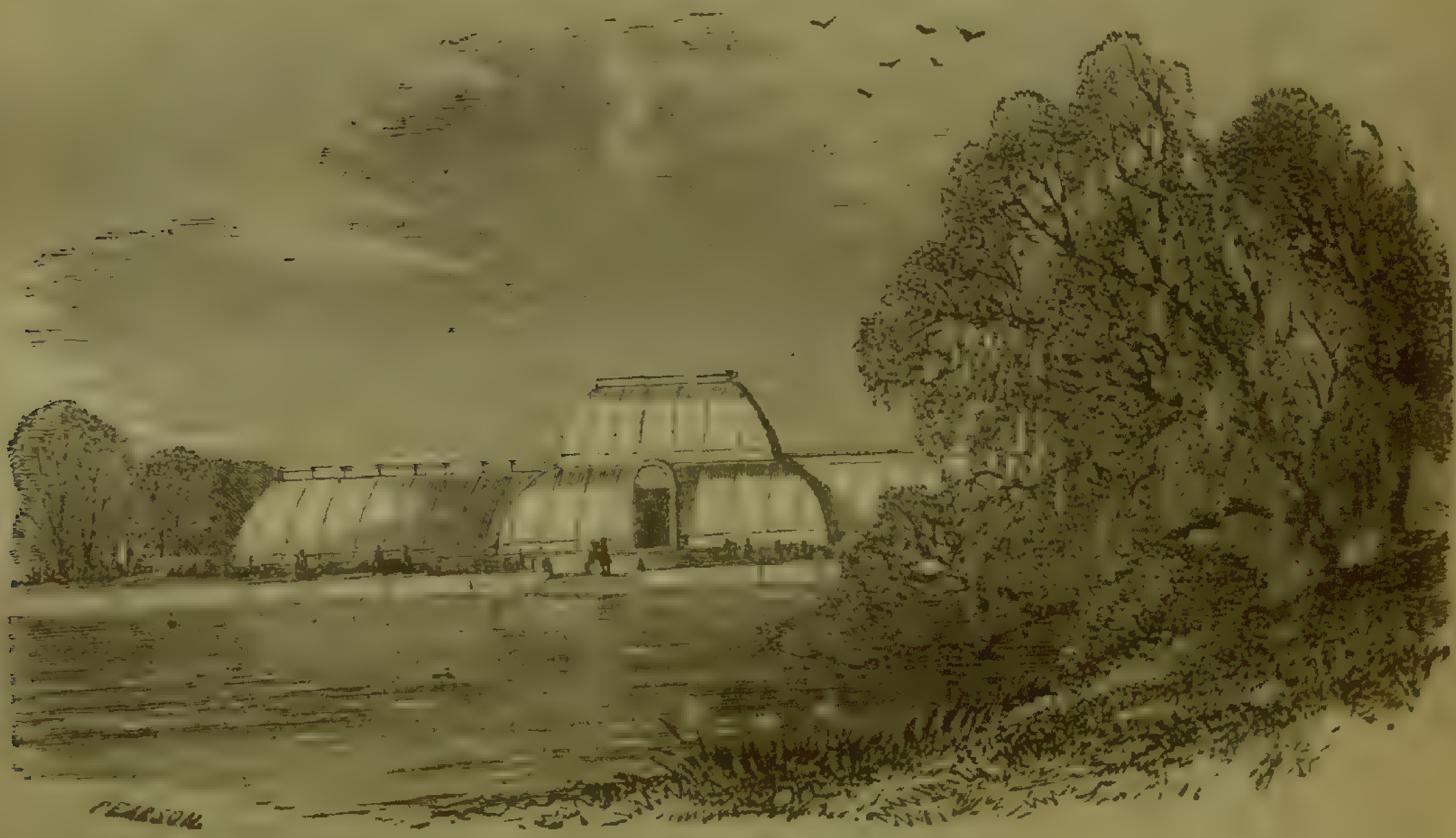

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> And decks his branch with blossoms over all
> But there was planted or grew natural."

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BOTANICAL MAGAZINE.

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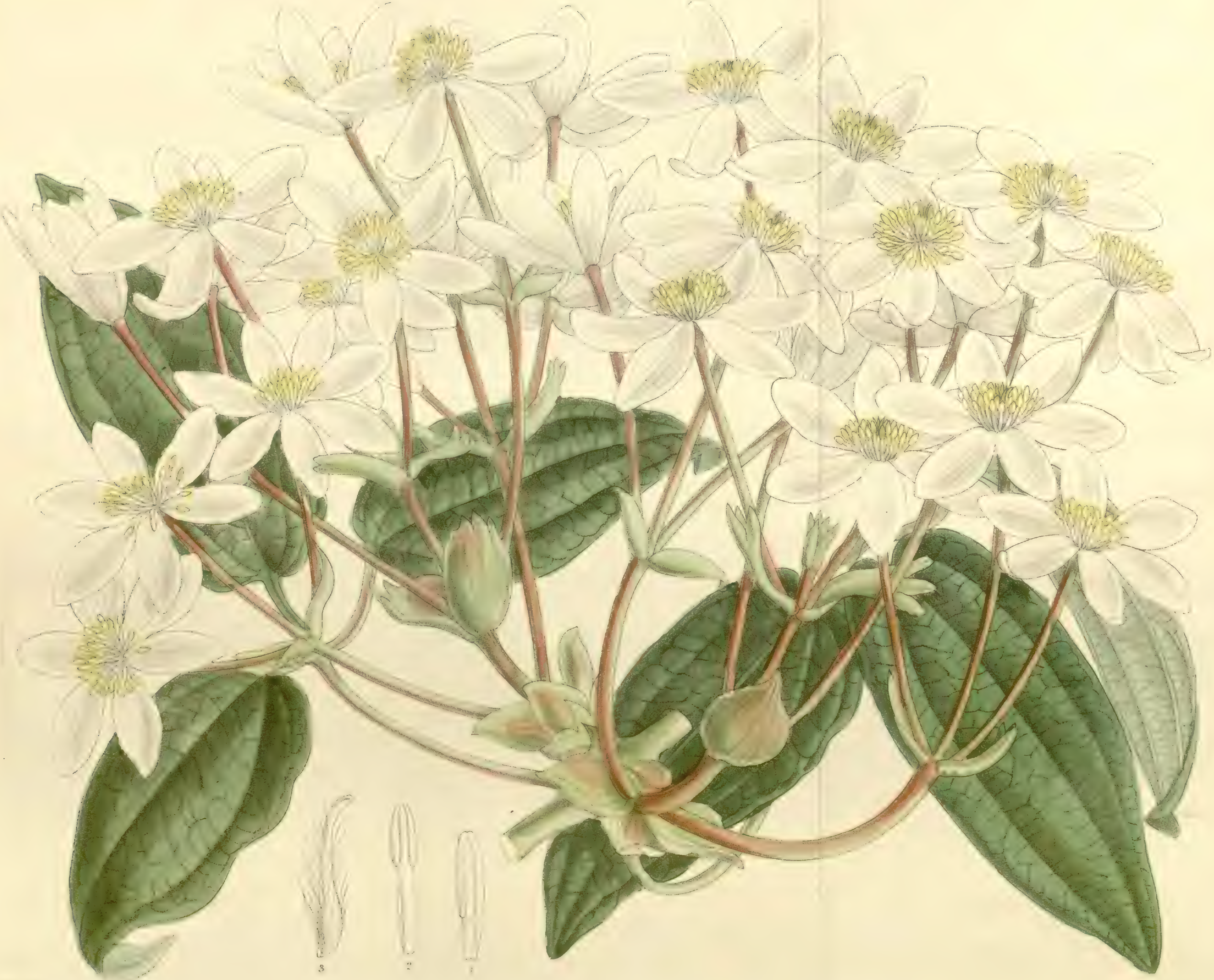

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TAB. 8587.

CLEMATIS ARMANDI.

China.

RANUNCULACEAE. Tribe CLEMATIDEAE.

CLEMATIS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 3.

Clematis Armandi, *Franch. in Nouv. Arch. Mus. Hist. Nat. Paris*, sér. 2, vol. viii. p. 184, t. 2; *Finet & Gagnep. Contrib. Fl. As. Or.* vol. i. p. 11; *J. H. Veitch in Journ. Roy. Hort. Soc.* vol. xxviii. p. 58, fig. 14; *Gard. Chron.* 1905, vol. xxxviii. p. 30; *Rehder & Wilson in Sargent, Pl. Wilson.* vol. i. p. 326; affinis *C. Meyenianae*, Walp., a qua inflorescentiis basi perulatis distinguitur.

Frutex alte scandens. *Rami* teretes, costulati, glabri. *Folia* trifoliolata, petiolata; petioli 6–8 cm. longi; petioluli laterales 1·5–2 cm. longi, terminale circiter 3 cm. longum; foliola ovato-lanceolata, basi leviter cordata vel rotundata, apice subacuta, plerumque breviter acuminata, 9–11 cm. longa, 3·5–4·5 cm. lata, integra, 5-nervia, nervis intermediis conspicuis ad apicem currentibus, exterioribus inconspicuis cum nervis transversis anastomosantibus, reticulata, glabra. *Cymae* axillares, bracteatae, pluriflorae, basi perulatae, e basi ramosae, puberulae; perulae magnae, ovatae; bracteae inferiores perulis similes, superiores oblongae, saepe trifidae; pedicelli floribus longiores. *Flores* albi, odorati. *Sepala* 5–7, obovato-oblonga, 2–2·5 cm. longa, patentia. *Filamenta* applanata, glabra, exteriora antheris longiora, interiora antheris breviora; antherae anguste oblongae, 3–3·5 mm. longae. *Styli* parte superiore excepta sericeo-plumosi. *Achaenia* elliptica, compressa, hirsuta, stylo patenter plumoso.—*C. hedysarifolia*, var. *Armandi*, Kuntze in Verh. Bot. Ver. Brandenburg, vol. xxvi. p. 152.—T. A. SPRAGUE.

The fine *Clematis* which forms the subject of our illustration is a very distinct and beautiful addition to that scarce group in our gardens, the hardy evergreen climbers. It is equal in beauty to *C. indivisa*, Willd., a form of which was figured at t. 4398 of this work, and has the advantage of being rather hardier than that New Zealand plant, which can only be grown out of doors in the south-west of England and Ireland. *C. Armandi* is a tall climber which occurs in thickets and on trees and bushes at various altitudes up to 5,500 feet above sea-level, from Hupeh in Central China to Szechuan and Yunnan. It was introduced to European cultivation by Mr. E. H. Wilson and is one of the finest species of *Clematis* obtained by that traveller. It is met with in gardens in two forms; one with sepals only half the

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width of those here figured, the other the much finer form now depicted, for material of which we are indebted to the kindness of Sir W. T. Thiselton-Dyer, on the walls of whose residence, The Ferns, Witcombe, it made a very beautiful display in April, 1914. The species appears to call for wall treatment in this country, and should not be pruned too severely, but allowed to form a rather loose tangle, the leading and supporting shoots alone being nailed. It requires a good loamy soil, and can be increased by cuttings in late summer. *C. Armandi* bears a considerable resemblance to *C. Meyeniana*, Walp., but may at once be distinguished from that species by the inflorescences, which are perulate at the base.

DESCRIPTION.—*Shrub*, far-climbing; branches terete, slightly ribbed, glabrous. *Leaves* trifoliolate, petioled; petiole 2¼–3¼ in. long; lateral petiolules ⅔–¾ in. long, end petiolule 1¼ in. long; leaflets ovate-lanceolate, base slightly cordate or rounded, subacute at the apex and usually shortly acuminate, 3¾–4¼ in. long, 1⅓–1¾ in. wide, entire, 5-nerved, intermediate nerves running to the tip, the outermost indistinct with transverse anastomosing nerves, reticulate, glabrous. *Cymes* axillary, bracted, several-flowered, perulate at the base, branching from the base, puberulous; perulae large, ovate; lower bracts like the scales, upper bracts oblong, often trifid; pedicels longer than the flowers. *Flowers* white, scented. *Sepals* 5–7, obovate-oblong, ¾–1 in. long, spreading. *Filaments* flattened, glabrous, the outer longer the inner shorter than the anthers; anthers narrow-oblong, under 2 lin. long. *Styles* silky-plumose except in the upper portion. *Achenes* elliptic, compressed, hairy; style plumose with spreading hairs.

Fig. 1, an inner stamen; 2. an outer stamen; 3, a carpel:—*all enlarged.*

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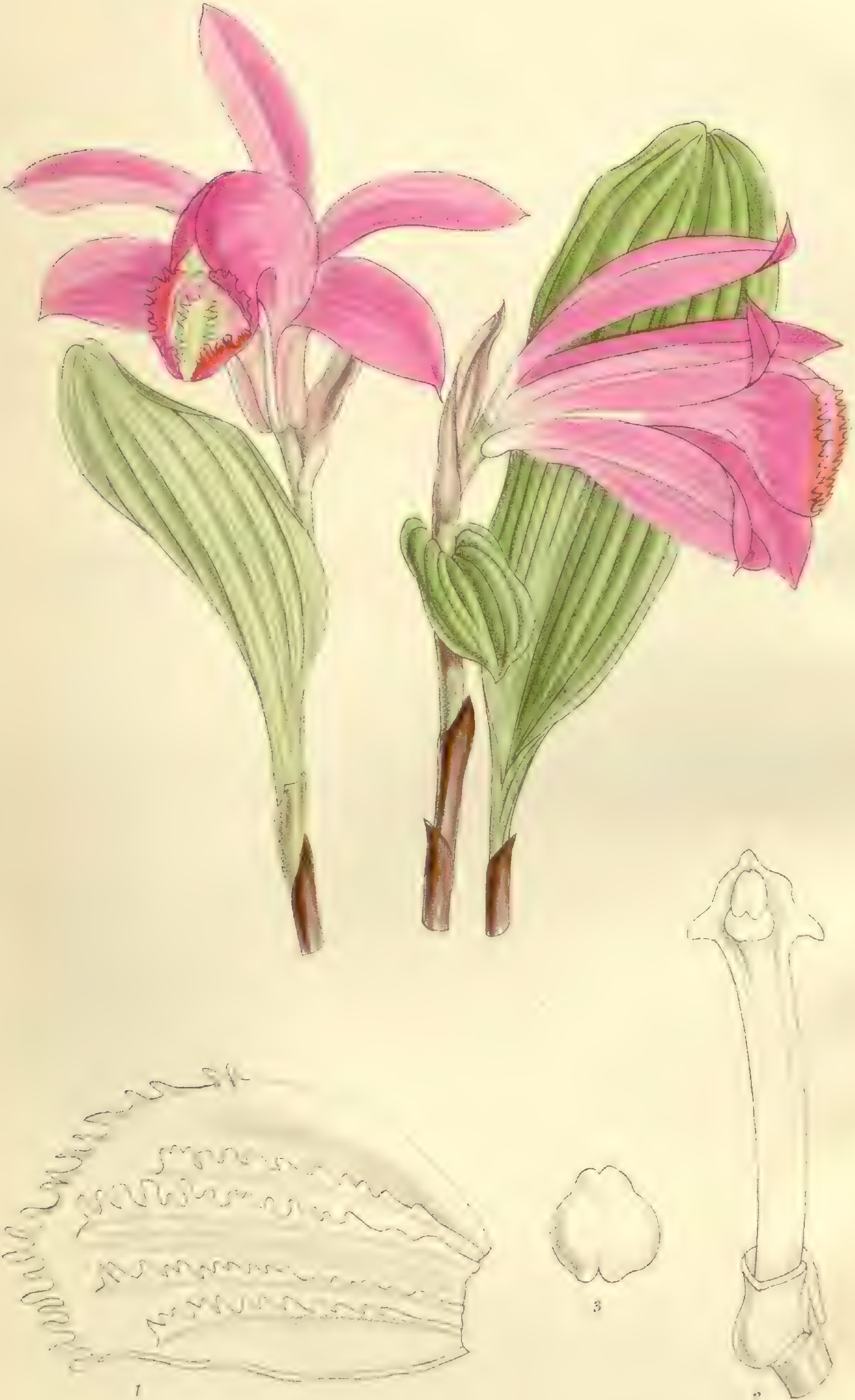

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TAB. 8588.

PLEIONE POGONIOIDES.

China.

ORCHIDACEAE. Tribe EPIDENDREAE.

PLEIONE, *D. Don. Prodr. Fl. Nepal.* p. 36; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 518, *sub* Coelogyne.

Pleione pogonioides, *Rolfe in Orch. Rev.* 1903, p. 291; 1914, p. 108; affinis *P. bulbocodioidei*, Rolfe, sed sepalis petalisque subaequalibus et labelli carinis valde crenatis differt.

Herba terrestris, 10–18 cm. alta; pseudobulbi ovoidei, apice attenuati, 1·2–1·5 cm. longi, monophylli. *Folia* elliptico-lanceolata, subobtusa, plicata, 5–17 cm. longa, 2–3·5 cm. lata. *Flos* terminalis, speciosus, roseus, labelli disco albidulo, pedunculo basi vaginis membranaceis obtecto. *Bractea* lanceolata, acuta, concava, 1·5–3 cm. longa. *Sepala* et *petala* subconniventia, oblongo-lanceolata, acuta vel apiculata, subaequalia, 3·5–4 cm. longa. *Labellum* circa columnam convolutum, amplum, 3·5–4 cm. longum, apice fimbriatum, late ellipticum vel suborbiculare, discus 4–5-lamellatus, lamellis valde et irregulariter crenatis. *Columna* clavata, incurva, circiter 3 cm. longa, alis triangularibus et membranaceis. *Capsula* ellipsoideo-oblonga, 2·5–3 cm. longa.—*Pogonia* sp., Hance in Journ. Bot. 1885, p. 247. *Coelogyne* (*Pleione*) *pogonioides*, Rolfe in Kew Bulletin, 1896, p. 196, *et* in Journ. Linn. Soc. vol. xxxvi. p. 23.—*C.* (*Pleione*) *Henryi*, Rolfe in Kew Bulletin, 1896, p. 195, *et* in Journ. Linn. Soc. vol. xxxvi. p. 22.—R. A. ROLFE.

Though there are several Chinese species of *Pleione*, only one of these has until now become established in cultivation; that species, *P. yunnanensis*, Rolfe, was figured at t. 8106 of this work. The one now figured, *P. pogonioides*, Rolfe, though it has been known longer than *P. yunnanensis*, for it was originally discovered in 1881, is the second to be introduced from China to orchid collections. Bulbs were received from there in 1912 by Messrs. Charlesworth and Company, in whose houses at Haywards Heath it flowered for the first time in February, 1914, and our figure has been prepared from material supplied by Messrs. Charlesworth for identification. The original specimens were gathered by Mr. T. Bullock on wet rocks at Wu Hu in the province of Am Hwei, at an elevation of 3,000 feet above sea-level, and were referred by the late Dr. Hance to the genus *Pogonia*. It was met with again by Mr. A. Henry on mountains near Patung, and from his material was described by Mr. Rolfe as *Coelogyne pogonioides,* in accordance with the idea long entertained, but now abandoned, that *Pleione* is no more than a section of *Coelogyne.* It was subsequently collected in various localities by Mr. Henry and by Mr. E. H. Wilson, who supplied living plants to Messrs. James Veitch & Sons, which, however, do not appear to have flowered. Mr. Rolfe finds that the plant described at the same time as *C. Henryi* is only an unusually well-developed form of *P. pogonioides.* The cultural requirements for *P. pogonioides* are the same as for *P. praecox* and the other species usually met with in collections.

DESCRIPTION.—*Herb,* terrestrial, 3–4 in. high; pseudobulbs ovoid, narrowed to the tip, $\frac{1}{2}$–$\frac{2}{3}$ in. long, 1-foliate. *Leaves* elliptic-lanceolate, rather blunt, plicate, 2–6$\frac{1}{2}$ in. long, $\frac{3}{4}$–1$\frac{1}{2}$ in. wide. *Flower* terminal, showy, rosy red with a whitish disk; peduncle clothed below with membranous sheaths. *Bract* lanceolate, acute, concave, $\frac{2}{3}$–1$\frac{1}{4}$ in. long. *Sepals* and *petals* somewhat connivent, oblong-lanceolate, acute or apiculate, subequal, 1$\frac{1}{3}$–1$\frac{1}{2}$ in. long. *Lip* convolute around the column, large, 1$\frac{1}{3}$–1$\frac{1}{2}$ in. long, fimbriate at the apex, wide-elliptic or suborbicular, disk with 4–5 lamellae which are strongly but irregularly crenate. *Column* clavate, incurved, about 1$\frac{1}{4}$ in. long; wings triangular, membranous. *Capsule* ellipsoid-oblong, 1–1$\frac{1}{4}$ in. long.

Fig. 1, portion of labellum; 2, column; 3, anther-cap:—*all enlarged.*

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TAB. 8589.

CRATAEGUS PUBESCENS, forma STIPULACEA.

Mexico.

ROSACEAE. Tribe POMEAE.

CRATAEGUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 626.

Crataegus pubescens, *Steud.*, **forma stipulacea**, *Stapf*; a *C. pubescente*, H. B. K. ut primo descripto et depicto differt foliis majoribus pro rata latioribus (praesertim in parte superiore), stipulis magis foliaceis et diutius persistentibus, indumento parciore.

Arbor parva, ad 10 m. alta, interdum spinis angulo recto patentibus ad 4 cm. longis armata, novellis albo-villosis mox glabrescentibus, ramulis adultis cortice fusco vel brunneo- vel griseo-fusco tectis, gemmis subglobosis obtusis glabris. *Folia* laxiuscule disposita, rarius in ramulis abbreviatis aggregata; laminae e subelliptico vel obovato ad oblanceolatum vergentes, plerumque acutae, basin versus cuneatim attenuatae, simpliciter vel subduplo serrato-crenatae, e medio basin versus integrae, interdum (praesertim in turionibus) grosse dentatae vel sublobatae, rarius trilobae, 4–8 cm. longae, 2–4 cm. latae, virides, demum subcoriaceae, autumno rubescentes vel aurantiacae, supra primo pilosulae, mox calvescentes, infra praeter nervos villosos laxe vel perlaxe villosulae, nervis lateralibus utrinque 5–7 obliquis leviter curvatis in crenas vel dentes excurrentibus supra impressis subtus prominulis; petioli 0·5–1·5 cm. longi, longiores saepe ob laminam decurrentem anguste alati, indumento laminae; stipulae plerumque foliaceae, saepe falcato-lineares vel lanceolatae et diutius persistentes, interdum lineares tenuiores caducae, integrae vel subintegrae, ad margines glandulosae vel eglandulosae ad plus quam 1 cm. longae. *Corymbi* 6–15-flori, magis minusve albo- vel incano-villosi, rarius fere calvescentes; bracteae stipulis conformes; pedicelli ad 2 cm. longi. *Receptaculum* turbinatum, villosulum, 3–4 mm. altum, disco rubicundo ad 4 mm. diametro. *Sepala* lineari-lanceolata vel linearia, integra vel apice paucidentata, plerumque eglandulosa, pilosa, 5–6 mm. longa, persistentia, in fructu plerumque suberecta. *Petala* alba, obovato-rotundata, circiter 8 mm. longa. *Stamina* 15–20; antherae demum pubescentes. *Styli* plerumque 2 vel 3, interdum 4 vel 5, basi pilis cincti. *Fructus* breviter pyriformis vel globosus, ad 25 cm. diametro, flavidus vel viridi-flavidus vel ad rufo-aurantiacum vergentes, lenticellis parce aspersi, calyce basi indurato coronati. *Pyrenae* plerumque 2, ambitu rotundato-ellipticae, facie superiore styli basi indurata conspicua, 7–8 mm. diametro, in dorso late carinatae, pariete crassissima.—*C. stipulacea*, Lodd. Cat. 1826, p. 40 (nomen tantum); Loudon, Gard. Mag. vol. ix. (1833), p. 630. *C. mexicana*, D. Don in Sweet, Fl. Gard. 2nd ser. t. 300; Lindley in Bot. Reg. t. 1910; Loudon, Arb. Brit. p. 843; non DC. *C. Lambertiana*, Hort. ex Steud. Nom. ed. 2, p. 432. *C. hypolasia*, Koch in Vers. d. Ver. z. Beförd. Gartenb. vol. i. p. 229. *C. pubescens*, Eggleston in Bull. Torr. Bot. Club. vol. xxxv. (1909) 505; non H.B.K

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Mespilus Loddigesiana, Spach, Hist. Nat. Veg. vol. ii. (1834), p. 54. *M. stipulacea*, Desf. ex Spach l.c. *M. mexicana*, Koch, Dendrol. vol. i. (1869) p. 132, ex parte.—O. STAPF.

The Thorn here figured is one of the forms of the Mexican Hawthorn or Tejocote, the earliest account of which we owe to Hernandez, who was resident in Mexico between 1571 and 1577, and has described it as the Texocotl or Rock Apple. The Tejocote is one of the few members of the genus *Crataegus* which inhabit the Mexican tableland, where it is appreciated, more especially by the Indian inhabitants, on account of its fruits, which are used as the basis of a national conserve. From a drawing of the Tejocote made in the field by the travellers Sessé and Mociño about the end of the XVIIIth Century, the species was described by De Candolle in 1825 as *Crataegus mexicana*. In the meantime, however, the travellers Humboldt and Bonpland, who had also met with the Tejocote near the mines of Moran in what is now the State of Hidalgo, in the beginning of the XIXth Century, had published a description in 1823 under the name *Mespilus pubescens*. From the synonyms cited by Dr. Stapf it will be seen that the generic position postulated for this tree by these distinguished travellers has not found general favour, and there is no room for doubt that the view of De Candolle is the preferable one. An almost more serious difficulty has arisen, however, as to its specific limitation. This has been caused by the excessive degree of variation displayed not merely in different individual trees but even, at times, in the same individual. It is to this circumstance that the number of trivial epithets used as specific names, which are enumerated in the synonymy, must be attributed. The whole question has recently been very fully dealt with by Dr. Stapf in the Kew Bulletin for the present year, and here it is sufficient to repeat that the plant from which the material for our plate has been derived is only a form, though a rather distinct and striking one, of the Tejocote. The species appears to have been introduced to cultivation in England by the eighth Lord Napier, through his friend Mr. A. B. Lambert, about 1824. The example at Kew, which is a small tree about fifteen feet high, and is perfectly hardy, was received from the Jardin des Plantes, Paris, in 1891. It is one of the handsomest of Thorns both in its flowers and in its yellow fruits, which are valuable from the cultural standpoint for the length of time that they remain upon the branches; often they do not fall until February.

DESCRIPTION.—*Tree*, 15–35 ft. high, sometimes armed with spines up to $1\frac{1}{2}$ in. long spreading at right angles from the twigs; young shoots white-villous, soon becoming glabrous; old shoots tawny or brown- or grey-tawny; buds subglobose, obtuse, glabrous. *Leaves* rather scattered, rarely close together on abbreviated shoots; from subelliptic or obovate to oblanceolate, usually acute, cuneately narrowed to the base, once to twice serrate-crenate, at least beyond the middle, sometimes from the middle to the base entire, occasionally—and more particularly on suckers—the leaves coarsely toothed or almost lobed, very rarely distinctly 3-lobed, $1\frac{1}{2}$–$3\frac{1}{4}$ in. long, $\frac{3}{4}$–$1\frac{1}{2}$ in. wide, green, when adult subcoriaceous, becoming red or orange-coloured in autumn, at first finely pilose above, soon becoming smooth, beneath villous on the nerves, elsewhere loosely or very loosely pubescent, lateral nerves 5–7 on each side the midrib, oblique, slightly curved, running out into the teeth, sunk above and raised beneath; petioles $\frac{1}{4}$–$\frac{2}{3}$ in. long, often slightly winged by the decurrent leaf-blade, pubescence as on the leaf; stipules usually foliaceous, often falcate-linear or lanceolate and rather distinctly persistent, sometimes linear and thinner and caducous, entire or nearly so, the margins glandular or not. *Corymbs* 6–15-flowered, more or less white- or hoary-villous, rarely almost glabrous; bracts like the stipules; pedicels up to $\frac{3}{4}$ in. long. *Receptacle* turbinate, somewhat villous, $\frac{1}{6}$–$\frac{1}{8}$ in. deep, disk reddish, $\frac{1}{6}$ in. across. *Sepals* linear-lanceolate or linear, entire or sparingly toothed at the tip, usually eglandular, pilose, $\frac{1}{4}$–$\frac{1}{5}$ in. long, persistent, in fruit usually suberect. *Petals* white, obovate-rounded, about $\frac{1}{3}$ in. long. *Stamens* 15–20; anthers pubescent. *Styles* usually 2 or 3, sometimes 4 or 5, pilose at the base. *Fruit* short-pyriform or globose, up to 1 in. across, yellow or greenish-yellow shading into reddish-orange, sparsely lenticelled, tipped with the calyx which is hardened at the base. *Pyrenes* usually 2, rounded-elliptic in outline, with the conspicuous hardened base of the style on the upperside, $\frac{1}{3}$ in. across, wide-keeled on the back.

Fig. 1, flower-bud; 2, vertical section of flower; 3 and 4, anthers; 5, a pyrene; 6, the same in section:—*all enlarged.*

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TAB. 8590.

SALVIA LONGISTYLA.

Mexico.

LABIATAE. Tribe MONARDEAE.

SALVIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1194.

Salvia longistyla, *Benth. Lab.* p. 295; affinis *S. coccineae*, Linn., sed foliis floribusque majoribus et calyce bilobo lobis longe acuminatis distinguenda.

Herba elata, ad 4–4·5 m. alta. *Caulis* tetragonus, patule glanduloso-pubescens. *Foliorum* petioli 4–9 cm. longi, patule glanduloso-pubescentes; laminae 7–14 cm. longae, 5·5–11 cm. latae, cordato-ovatae, acutae, serrato-dentatae, supra glabrae, subtus ad nervos pubescentes. *Racemi* saepe 3·5 dm., nonnunquam 6 dm. longi, glanduloso-pubescentes; verticillastri 2·5–4·5 cm. distantes, 8–16-flori. *Pedicelli* 8–15 mm. longi. *Calyx* inaequaliter bilabiatus, compressus, 9-nervis, fusco-viridis; tubus 1–1·3 cm. longus; labia 7–11 mm. longa, subulato-acuminata vel aristata, labium inferus apice breviter bifidum. *Corolla* e calyce longe exserta, rubro-coccinea, pubescens; tubus 1·8 cm. longus, apice 4 mm. diametro, levissime curvatus, compressus; labium superus 7–8 mm. longum, rectum vel apice recurvum, anguste oblongum, apice emarginatum; labium inferus parvum, breviter 3-lobum, lobo medio 2·5 mm. longo, 3·5 mm. lato, transverse elliptico obtuso incurvo-erecto. *Stamina* exserta, quam corolla 7 mm. longiora, recta, rubra. *Stylus* staminibus multo longior, inaequaliter bifidus lobo inferiore minimo, ruber.—*S. rectiflora*, Vis. Sem. Hort. Patav. 1839, in Linnaea, vol. xiv. Litt.-Ber. p. 138. *S. aristulata*, Mart. & Gal. in Bull. Acad. Brux. vol. xi. pars 2, p. 67 (1844).—N. E. BROWN.

The Mexican *Salvia* here figured was first discovered near Zinepecuaro in 1830 by Mr. G. J. Graham, and three years later was described by the late Mr. Bentham. It seems probable that seeds were sent to Europe by Graham, because the plant appeared in cultivation almost simultaneously with its original description. Whether its redescription by Professor Visiani indicates a second introduction is on the whole doubtful; more probably it only indicates the first appearance of the plant in the Padua Botanic Garden. Its description a third time at Brussels, however, suggests independent introduction from Mexico. In its foliage and its far-exserted stamens and style the species bears some resemblance to *S. coccinea*, Linn., but in its calyx it is remarkably distinct from that and all the other allied species; the tube and lobes are longer, while the latter terminate in fine awn-like points; the two lobes of the lower lip are, besides, united for the greater part of their length, and their distinction is only indicated by the awn being shortly divided at its tip. The material for our plate has been derived from a plant raised at Kew from a cutting presented in 1912 by Dr. Robertson-Proschowsky, Nice. The plant is easy of culture and rapid in growth, reaching in from nine to ten months a height of fourteen or fifteen feet, with a freely branching crown. The branches end in long loose panicles of rosy-red flowers, some of the panicles being a couple of feet in length. It has at Kew been grown in a sunny position in a slightly heated greenhouse and liberally manured. The exceptional height and vigour of growth precludes its use save under exceptional circumstances as a greenhouse plant in the British Islands, but in countries where there is little or no risk from frost, as in the Mediterranean region, *S. longistyla* ought to form a striking and desirable denizen in an open-air border. The flowers are produced during the winter months.

DESCRIPTION.—*Herb*, up to 15 ft. in height. *Stem* 4-angled, glandular-pubescent with spreading hairs. *Leaves* petioled, cordate-ovate, acute, serrate-dentate, glabrous above, pubescent on the nerves beneath, 3–$5\frac{1}{2}$ in. long, 2–$4\frac{1}{2}$ in. wide; petiole $1\frac{1}{2}$–$3\frac{1}{2}$ in. long, glandular-pubescent with spreading hairs. *Racemes* often 15 in., occasionally up to 25 in. long, glandular-pubescent; verticillasters 8–16-flowered, 1–$1\frac{3}{4}$ in. apart; pedicels $\frac{1}{3}$–$\frac{2}{3}$ in. long. *Calyx* unequally 2-lipped, compressed, 9-nerved, tawny-green; tube $\frac{1}{3}$–$\frac{1}{2}$ in. long; lips rather shorter than the tube, subulate-acuminate or aristate, the arista of the lower lip slightly 2-fid at the tip. *Corolla* far-exserted, red-pink, pubescent; tube $\frac{3}{4}$ in. long, $\frac{1}{6}$ in. across at the mouth, slightly curved, compressed; upper lip about $\frac{1}{5}$ in. long, narrow-oblong, straight or recurved at the emarginate tip; lower lip small, shortly 3-lobed, mid-lobe $\frac{1}{10}$ in. long, $\frac{1}{7}$ in. wide, transversely elliptic, obtuse, incurved-erect. *Stamens* exserted nearly $\frac{1}{3}$ in. beyond the top of the corolla, straight, red. *Style* much longer than the stamens, unequally 2-fid, with the anterior lobe very small, red.

Fig. 1, calyx, laid open, showing ovary and style; 2, corolla, laid open, showing stamens and staminodes; 3, an anther; 4, ovary, surrounded by glands:—*all enlarged.*

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TAB. 8591.

CERATOSTIGMA WILLMOTTIANUM.

China.

PLUMBAGINACEAE. Tribe PLUMBAGEAE.

CERATOSTIGMA, *Bunge*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 628; *Prain in Journ. Bot.* vol. xliv. (1906), p. 4.

Ceratostigma Willmottianum, *Stapf*; species nova *C. plumbaginoidi*, Bunge et *C. asperrimo*, Stapf ex Prain, similis, a priore imprimis foliis minoribus utrinque pilosis, corolla pallidiore, antherarum apicalibus tantum brevissime e tubo exsertis, stigmatibus antheras longe superantibus et habitu, ab altero forma textura et indumento tenuiore foliorum, ab ambobus perulis coriaceis lanceolatis distinctum.

Frutex multiramosa, 1–1·5 m. alta, caulibus angulatis strigilloso-hirtulis saepe purpurascentibus. *Innovationes* basi perulis lanceolatis vel lanceolato-subulatis indutae. *Folia* sessilia, oblanceolata vel elliptico-oblanceolata, acuta vel subacuta, setoso-mucronata, basin versus cuneatim attenuata, 3-5 cm. longa, 1·3–2 cm. lata, viridia, supra sparse, infra copiosius et asperius hirtella, in margine rigide ciliata, sparse et minutissime glanduloso-furfuracea. *Capitula* terminalia, saepe minoribus nonnullis ex foliorum summorum axillis ortis additis; bracteae lanceolatae, acuminatae, carinatae, mucronatae, rigide ciliatae, exteriores 14–10 mm. longae. *Calyx* tubulosus, 5-dentatus, tubo circiter 11 mm. longo viridi albo-5-striato, dentibus subulatis purpurascentibus 3 mm. longis. *Corollae* tubo roseo circiter 18 mm. longo, limbo amoene coeruleo, lobis truncato-obovatis mucronulatis 8 mm. longis superne 7 mm. latis. *Antherae* purpurascentes, vix 2 mm. longae, apicibus e tubo brevissime exsertis. *Styli* albidi, 2 mm. longi, toti exserti.—O. STAPF.

The singular distribution of the species of the Plumbaginaceous genus *Ceratostigma* has been the subject of comment for more than sixty years. The genus was based originally on a species from Northern China described by Bunge in 1834 which has long been a favourite plant in English conservatories and, with some little protection during severe weather in winter, also in collections out of doors. An excellent figure of that species, *C. plumbaginoides*, Bunge, which is often known in gardens by the name *Plumbago Larpentae*, Lindl., bestowed on the plant in 1847 when it was first introduced to England, has been provided at t. 4487 of this work. The only other species of the genus which was known when that figure was published is an Abyssinian one, treated by

DECEMBER, 1914.

Hochstetter in 1840 as the type of his genus *Valoradia*. Hochstetter's plant had, however, been collected by Salt a generation earlier, and had been treated in 1814 by R. Brown as a *Plumbago*, *P. eglandulosa*. The first observer to recognize the identity of *Ceratostigma* and *Valoradia* was Boissier, who, for reasons no longer considered adequate, in 1848 employed Hochstetter's name in preference to the older one used by Bunge. The discovery, since Boissier wrote, of a number of other species of *Ceratostigma* in Central and South-western China, in Indo-China, in Tibet and in Bhutan, has reduced considerably the extent of the gap between the localities occupied by the genus on which stress has so often been laid. The eight species now known include two, from Abyssinia and Somaliland, that are best distinguished from their six Asiatic congeners by their sessile stigmatic glands. The six Asiatic species include two that are best distinguished from the other four because their leaf-buds and shoot-bases are not perulate. The familiar *C. plumbaginoides*, already alluded to, is one of the species with naked buds; it forms as a cultivated plant large tufts, rarely more than a foot in height, with striking dark-green leaves that take on a handsome brownish-red autumnal tint, and make an admirable and effective contrast with the gentian-blue flowers. Except for its larger size and looser habit the species now figured, *C. Willmottianum*, Stapf, as grown at Kew, resembles *C. plumbaginoides* so closely that it might pardonably be taken for a form of that species with rather smaller leaves of a paler green which do not display the autumnal bronzing. Closer attention to the plant now figured, for the material of which we are indebted to Miss E. A. Willmott, in whose garden at Warley Place two plants were raised from seed received by her from the Arnold Arboretum, and obtained by Mr. E. H. Wilson during his last journey in Western China, shows, however, other marked differences. The flowers are of a rather paler blue than in *C. plumbaginoides*; the anthers are hardly exserted; the leaves are hispidly hairy on both surfaces, as well as hispidly ciliate on the margin, whereas in *C. plumbaginoides* only the margin is hispid; finally, the buds are protected by coriaceous scales, so that, in spite of its close general resemblance to *C. plumbaginoides*, the affinity of *C. Willmottianum* is really with *C. minus*, Stapf, and *C. Griffithii*, C. B. Clarke, which are shrubs. Miss Willmott informs us that of the two plants raised by her one has been grown at Warley in Essex, the other at Spetchley in Worcestershire, and that both are now shrubs five feet high. In both places, as at Kew, the treatment most suitable for *C. plumbaginoides* is that best adapted for *C. Willmottianum*, which has proved equally hardy and equally easy to propagate. The two flower at the same time and in equal profusion, during the months of July to December.

Description.—*Shrub*, freely branching; stems angular, strigillose, often purplish; young shoots perulate, the scales firm, lanceolate or subulate-lanceolate. *Leaves* sessile, oblanceolate or elliptic-oblanceolate, acute or subacute, setose-mucronate, cuneately narrowed to the base, $1\frac{1}{4}$–2 in. long, $\frac{1}{2}$–$\frac{3}{4}$ in. wide, green, sparingly harshly hairy above, more plentifully beneath, stiffly ciliate on the margin, sparingly and finely glandular-scurfy. *Heads* terminal, with often a few smaller in the uppermost axils; bracts lanceolate, acuminate, keeled, mucronate, rigidly ciliate, the outer $\frac{1}{3}$–$\frac{1}{2}$ in. long. *Calyx* tubular, 5-toothed, tube under $\frac{1}{2}$ in. long, green with 5 white bands, teeth subulate, purplish. *Corolla* hypocrateriform; tube rosy-red, $\frac{3}{4}$ in. long; limb bright-blue; lobes truncate-obovate, mucronulate, $\frac{1}{3}$ in. long, over $\frac{1}{4}$ in. wide. *Anthers* purplish, under $\frac{1}{12}$ in. long, tips shortly exserted. *Styles* whitish, $\frac{1}{12}$ in. long, quite exserted.

Fig. 1, leaf and leaf-bud; 2, bud-scales; 3, flowers and bracts; 4 and 5, anthers; 6, pistil:—*all enlarged.*

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